The newsweekly of enterprise network computing

NetworkWorld

February 7, 2000 Volume 17, Number 6 www.nwfusion.com

Making Sense of Directories

NetworkWorld TECH·UPDATE℠

The right directions make it so much easier.

It's time to clear the confusion

If you are responsible for any aspect of managing, building or running networks for next-generation business or e-commerce applications, having a clear understanding of directory-enabled networking is critical. You must be able to understand just how directories work today and in the future, what role they will play in supporting next-generation network and systems management, and how they will make business easier and more profitable. You need a cohesive directory strategy.

Program Highlights

- Explore directory support for policy-based networking and quality of service capabilities
- Examine how directories can improve security
- Understand how to build toward Directory Enabled Networking
- Assess the benefits of meta-directories in your enterprise infrastructure
- Review available tools and add-ons to help build and manage directories

Presenters

Gary Rowe, President, The Burton Group THE BURTON GROUP
Dan Blum, Senior Vice President and Principal Consultant, The Burton Group
Doug Barney, Executive Editor of News for *Network World* NetworkWorld

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See inside for complete details!

5338

VIP#: WRAP

This seminar is sponsored by leading directory equipment and service providers such as Banyan, Business Layers, Entevo, FastLane, Isocor, Microsoft, Novell, Process Software and Radiant Logic. For a sneak preview, turn to the Sponsor Showcase.

NetworkWorld TECH·UPDATE℠

TURN TO INSIDE BACK COVER

Learn from the Leaders

Gary Rowe

Gary Rowe, President of The Burton Group, specializes in directories, network architecture and messaging technologies. He has over 20 years of network industry experience in consulting, marketing, product management, product/market positioning, technology education, strategic alliance development, and industry trend analysis. Gary has been responsible for leading major product and industry initiatives and is considered one of the world's leading network technology experts and visionaries.

THE BURTON GROUP

Dan Blum

Dan Blum, Senior Vice President and Principal Consultant, The Burton Group, specializes in directories, public key infrastructure, network security, messaging, groupware and electronic commerce. Dan is an internationally recognized expert consultant, writer and instructor, and has worked with key standards development groups. He is currently vice chairman of the EMA Directory Committee. Dan is a columnist with *Network World* and is currently authoring the book "Understanding Microsoft Active Directory Services."

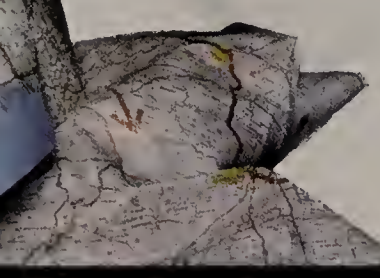
Doug Barney

Doug Barney, Executive Editor of News for *Network World*, is a regularly featured guest industry expert on local and national radio and television news/talk shows. A 15-year computer journalism veteran, Barney has written for *InfoWorld, ComputerWorld*, and was editor in chief of *AmigaWorld* magazine. Doug will moderate the vendor panel and roundtable discussion and, acting as your advocate, ensure that your questions are heard and answered to your satisfaction.

NetworkWorld

After attending this seminar, you will:

- Have a clear understanding of how to formulate a cohesive directory strategy
- Know which vendors you want to target and partner with
- Have no fear of integrating directory technologies
- Begin reaping the benefits of directory-enabled networking such as streamlined network and systems management, and simplified network and e-commerce operation



VIP#: WRAP

8:00 a.m. Registration, Breakfast, Vendor Demonstrations

9:00 a.m. Consult the Experts

There will be a 30 minute break at 10:00 a.m. to meet the sponsoring vendors and network with your peers.

Get expert technical instruction on directory technologies. This tutorial, presented by The Burton Group*, will go deep into your concerns about bringing your enterprise safely and securely into a directory-enabled future. The presenter will focus on the following important technical points that you should understand in order to start formulating your directory strategy:

1. *How directories can support e-business across the Internet, intranets and extranets*
2. *Intelligent networking built on directory integration as exemplified by the Directory Enabled Networking (DEN) initiative*
3. *Directory support for security and Public Key Infrastructure (PKI)*
4. *Benefits of a directory infrastructure for the application developer*
5. *The role of eXtended Markup Language (XML) and Directory Services Markup Language (DSML) in extending directory services across the Internet*
6. *LDAP and meta-directories in support of application integration*
7. *Directory and network integration*

** Instructor will be either Gary Rowe or Dan Blum, depending on which seminar you attend.*

11:30 a.m. Listen to the Vendors

There will be a one hour break at 12:15 p.m. for a complimentary luncheon and vendor demonstrations.

Hear how leading vendors are addressing your biggest issues — today. Presentations by technical representatives from Banyan, Entevo, FastLane, Microsoft, Novell and Process Software are an integral part of this program. This is a convenient opportunity for you to compare their offerings in one place, at one time, and decide which vendor solutions will shape the future of your organization's directory-enabled strategy.

2:00 p.m. Keynote Address: The Reality Check

The Burton Group provides a reality check by summarizing and viewing the technologies and strategies outlined in the vendor presentations in light of the technical reality and the decision points facing network managers. This keynote sets the stage for the following interactive roundtable.

2:15 p.m. The Hot Seat Roundtable

You won't want to miss the most exciting part of the day. Moderated by *Network World's* Executive Editor of News, Doug Barney, this is an interactive exchange among the vendors, The Burton Group, and you. It's a chance for the vendors to go head-to-head on issues raised earlier in the day, and an opportunity for you to ask them your specific questions. Participate in our "Best Question Contest" and you may win a prize for having the best question of the day as judged by Doug Barney.

3:00 p.m. Closing Remarks and Raffle

Throughout the day, you'll have the chance to enter our raffle for a DVD player. You must be present at time of drawing to win.

Seminar Dates and Locations

February 23	Chicago	Holiday Inn O'Hare
February 24	Dallas	The Fairmont Hotel
March 1	New York	Grand Hyatt
March 2	Boston	Sheraton Needham Hotel
March 21	San Francisco	Hyatt Regency
March 22	Los Angeles	Marriott Downtown
April 11	Atlanta	Cobb Galleria
April 12	Washington, DC	Sheraton Crystal City

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QWEST HEADACHES Carrier drops frame relay circuits, has to upgrade switches. Page 6.

END RUN? Bell Atlantic and GTE, with former FCC head Richard Wiley's help, say they are willing to sell GTE's Internet unit to complete the merger, but detractors call the offer a "sham." Page 14.

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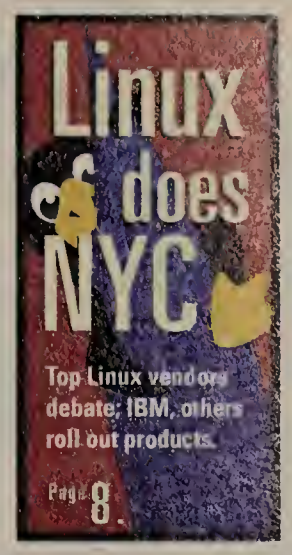
NetworkWorld



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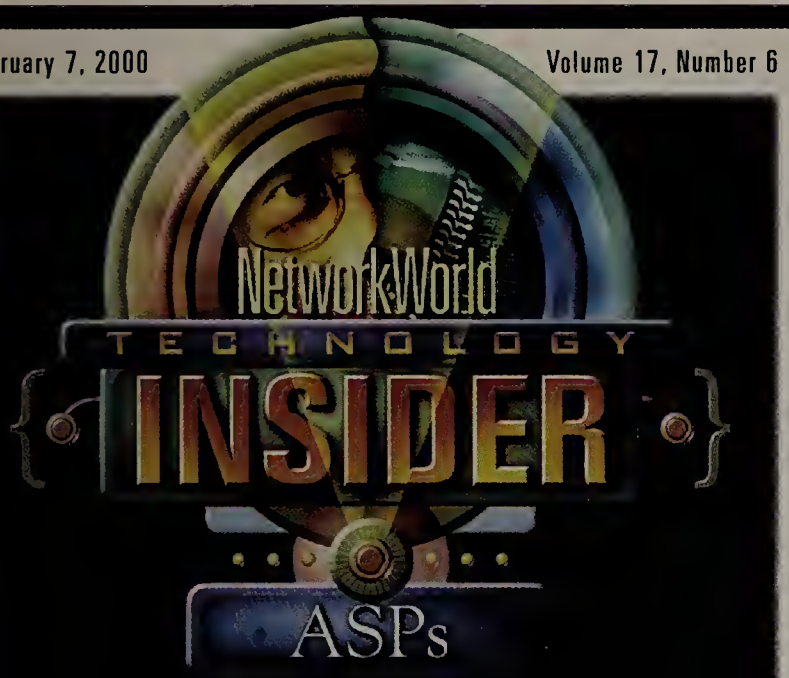

Welcome to the first edition of Network World's Technology Insider, a series of in-depth articles focusing on today's hot network technologies.

ASP PHENOMENON

Today, it seems like every vendor out there claims to be an ASP or has an ASP strategy. Reporter Lauren Gibbons Paul traces the rise of the ASP phenomenon and highlights the risks and rewards of the application rental model. **PAGE 58.**

Case studies: Learn how three ASP pioneers upgraded their networks. **PAGE 62, 64, 66.**

Face-off: Should you rent software directly from the vendor or from a third-party ASP? **PAGE 68.**

Management Strategies: Tips for managing your ASP relationship. **PAGE 70.**

Novell to make bigger QoS, policy mgmt. push

New ZENworks, e-commerce packages to highlight broad product rollout.

BY DENI CONNOR

Companies should be able to more easily enact quality-of-service (QoS) policies and software uniformity across enterprise nets using products Novell will roll out this week.

The company will announce two additions to its ZENworks line: ZENworks for Networks and ZENworks for Servers. In a press conference Tuesday, Novell will also reveal long-awaited details about its iChain business-to-business e-commerce products and roll out an upgrade to its Internet messaging application, called Novell Internet Messaging System.

Novell already sells ZENworks for Workstations, a Novell Directory Services (NDS)-enabled application that lets managers automatically schedule and perform software changes to desktops, inventory

See **Novell**, page 16

NetworkWorld Q&A

Schmidt speaks

Novell CEO Eric Schmidt on:

- Where directory technology is headed.
- The coming of Windows 2000.
- Novell's e-commerce product strategy.

See page 16. For more of the interview visit www.nwfusion.com, DocFinder: 6735.

STAN BAROUH

Ford paves employees' road to 'Net

BY CAROLYN DUFFY MARSAN

DETROIT — Ford wants its workers to get wired. That's why company and union leaders last week announced a groundbreaking program to provide all 300,000 Ford employees with the opportunity to buy a new PC and printer, and receive Internet access for home use at a nom-

See **Ford**, page 88

Firm taps B2B e-comm to boost customer service

BY ELLEN MESSMER

RICHMOND, VA. — Weidmuller's warehouse on the outskirts of Richmond is packed neatly to the ceiling with row after row of the manufacturer's terminal-block connectors, wiring gadgetry that goes into everything from washing machines to industrial-control equipment.

LESSONS FROM IN SITE LEADING USERS

Last month, Weidmuller went live with a business-to-business e-commerce Web site that is changing how its wiring products get sold and shipped.

Before the e-commerce era arrived at Weidmuller, customer service representatives were back and forth on the phone with dozens of distributors, checking on shipment dates or the availability of parts. Sorting through faxed purchase orders, the sales representa-

See **B2B**, page 92

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SUN ECLIPSED BY 8-WAY SERVER. READ ALL ABOUT IT.

Talk about being overshadowed. Compaq's new 8-way ProLiant 8000 and 8500 servers deliver nearly twice the performance of Sun Enterprise 3500 servers, yet for half the total cost. That's four times the price/performance!, and these are TPC-C™ benchmarks. 8-way ProLiant also set records running NT,® SAP and NetWare.® You get breakthrough scalability, near total availability and epic access (440 gigs) to storage. This Compaq *NonStop*™ eBusiness Solution means no matter how big you grow, you won't have to leave the IT environment your people know best. Nor the helpful embrace of Compaq's 27,000 service experts worldwide. For more about Compaq 8-way: www.compaq.com/8-way.

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ROUTING	OSPF	✓	✓
	RIP	✓	✓
	Legacy Protocols	✓	✓
VPN	IPSec	✓	✓
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THIS WEEK ONLINE

ASP action. It's one of the biggest buzzwords around, but what exactly is an application service provider (ASP), and how do you pick one? Read our Tech Insider package (starting on page 58), then visit our updated ASP research area online.

Here's what you'll find:

- **ASP search engine** — We've culled the Web for ASP sites and indexed them for you along with *Network World* articles.
- **Reports** — What impact have ASPs made on the IT industry? How can an ASP change your life? Find out in these white papers.
- **Databases** — Do you need to find an ASP quick? Use one of the databases we've linked to access information about top ASPs.
- **Research** — What's in store for ASPs? Check out reports from the ASP Consortium to stay ahead of the curve.
- **Newsletters** — Sign up for our free e-mail newsletter, and learn all about the newest services from ASPs.

DocFinder: 6727

Windows 2000. Microsoft's new operating system is ready to roll, but what does that mean for network managers? Read our story on page 10, and then head online for more from our columnists. Dan Blum says that planning for Windows 2000 could be as important as planning for Y2K, while columnist Rob Enderle says that now is the time to look at the rest of your network. Enderle encourages users to consider consolidating and centralizing server farms. **DocFinder: 6734**

Linux Showdown. What happens when you get the major Linux vendors together in one room? Log on for the audio transcript to our Linux Showdown at LinuxWorld Expo in New York last week. You'll hear what separates Caldera from SuSE, and what the future holds for the little operating system that could. **DocFinder: 6739**

NetworkWorld

FEBRUARY 7, 2000

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Special Focus

UTILITIES IN TELECOM

Utilities seek a formula to serve the WAN needs of enterprise nets. Page 38.

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HOW TO CONTACT US

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FAX: (508) 490-6400; E-MAIL: nwcirc@nww.com;
STAFF: See the masthead on page 12 for more contact information. **REPRINTS:** (717) 399-1900

NetworkWorld TECHNOLOGY INSIDER ASPs

ASP PHENOMENON: CASE STUDIES

Paul Marshall added real-time messaging to his Web site in seven days using an ASP. PAGE 62.

David Blumhorst was an ASP skeptic. Now he's a true believer. PAGE 64.

Ed Hayes needed to upgrade to SAP R/3, so he turned to an ASP. PAGE 66.

NEWS BRIEFS, FEBRUARY 7, 2000

Vodafone lands Mannesmann

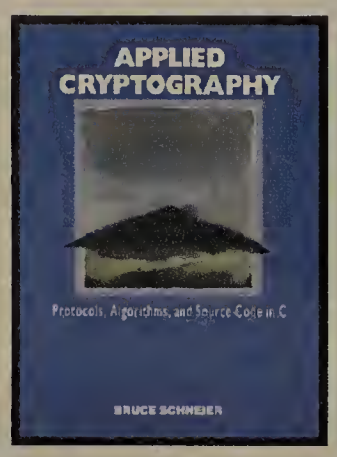
After resisting bitterly for months, the management of German mobile carrier Mannesmann last week agreed to be purchased for $190 billion by Britain's Vodafone Airtouch, which also has a sizable presence in the U.S. If Mannesmann shareholders approve, the resulting company is expected to try to unify wireless handsets and protocols between the U.S. and Europe and push heavily into wireless Internet access. Integration challenges are likely to be significant, and Mannesmann wrested promises of "respect" for its corporate culture and "codetermination" of decisions about its side of the business in the joint merger announcement. Vodafone obtained its U.S. presence when it bought Airtouch, a spinoff of Pacific Bell from the mid-1990s, and a more recent partnership agreement with Bell Atlantic.

Diversification is insurance, too

ChannelPoint, a Colorado Springs e-commerce service provider for insurance companies, has merged with InsurQuote Systems, a Provo, Utah vendor of comparative insurance-rating software. ChannelPoint says that by integrating the InsurQuote software into the ChannelPoint Commerce Internet Exchange software, it will be able to offer business-to-consumer services to the public in addition to its current business-to-business online services. InsurQuote will operate as a ChannelPoint subsidiary. Terms of the agreement were not disclosed.

Security guru to stretch wings

Cryptologist, security guru and author Bruce Schneier, who has run his Minneapolis consulting firm Counterpane as a one-man operation for years, is taking his act to Silicon Valley to stage a bigger show. Backed with venture capital funding from Accel Partners and Bessemer Ventures, Schneier will launch Counterpane Internet Security next month to provide managed security services to companies. Dubbed Managed Security Monitoring, the idea is to hire out security pros to monitor corporate networks round the clock by having them keep an eye on already-installed network-security products that might overwhelm the abilities of in-house staff. It's like outsourcing physical security to ADT, sources say.



Windows 2000 shows cracks

While Win-2000 isn't yet off the presses, it's first security patch is. Microsoft has already patched two security flaws, still almost two weeks before the operating system's ship date. The flaws affect Microsoft Index Server, which lets users perform full-text searches of documents on a network via a Web browser. One flaw could allow an unauthorized user to view files, but not alter, add or delete files. The second could be used to access the locations of Web directories on the server. Microsoft has issued a patch, and users report that the problems are solved. Win 2000 will ship Feb. 17.

'Earth-shattering' advance for IPv6

The Internet engineering community enjoyed a much-needed bit of fun last week when the first computer game was ported to the controversial IPv6 standard. Viagenie, a Quebec IT consulting firm, is offering an IPv6-compatible version of Quake, the 3-D interactive combat game played by many users on the 'Net. Viagenie ported the Quake source code to run on FreeBSD 3.2, which can support IPv6. A Windows NT version with IPv6 support is under development. Viagenie is hosting a Quake IPv6 server that is available to the Internet community. And every Friday at 4 p.m. EST, the company's employees will play a game that anyone can join. For more information, visit www.viagenie.qc.ca/en/quake.shtml.

Battle brewing over 'whois'

Who is the rightful owner of the term "whois"? The question is shaping up to be a trademark battle between Verio, an Englewood, Colo., Web hosting company, and domain name powerhouse Network Solutions. Verio has applied for a trademark on "whois," which is the same phrase — although in capital letters — that Network Solutions has used for years to refer to its database of Internet domain names and holders. Verio is looking to own whois for use in computer databases related to "directory resources available on global information networks," according to the company's application with the Patent and Trademark Office. A Network Solutions spokesman says the company is aware of the trademark application but will not comment on it. A Verio spokesman did not return calls.

New frame relay glitch hits Qwest

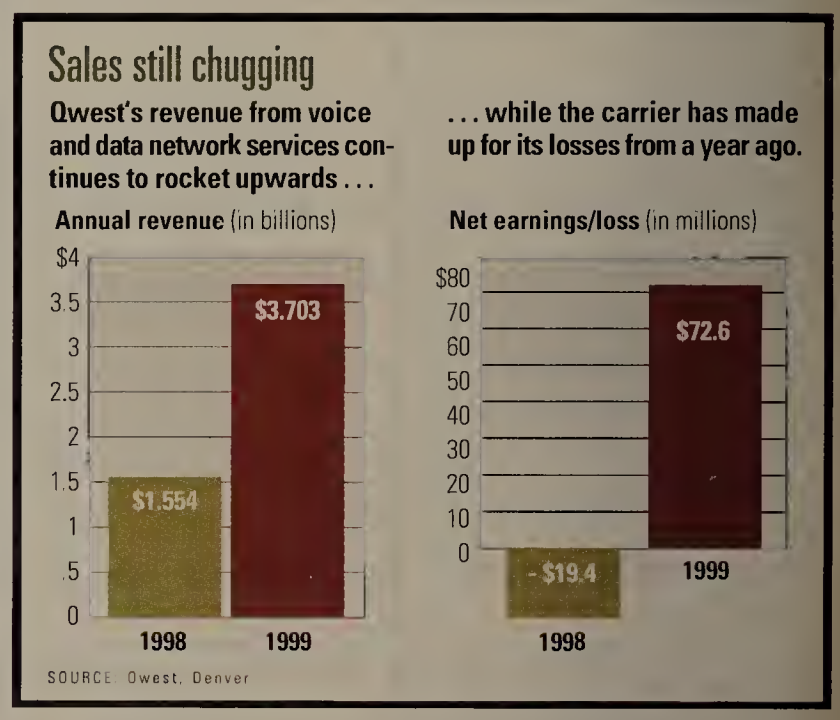
Transport, switch problems cause session timeouts.

BY DAVID ROHDE

DENVER — National long-distance carrier Qwest last week confirmed that its frame relay and ATM users suffered numerous dropped circuits and other disruptions during a recent 11-day period.

in, according to Qwest officials.

As a result, between Jan. 18 and 29, some users saw individual permanent virtual circuits (PVC) go down for up to several hours at a time when rerouting routines failed to kick in quickly enough. Others saw time-sensitive applications,



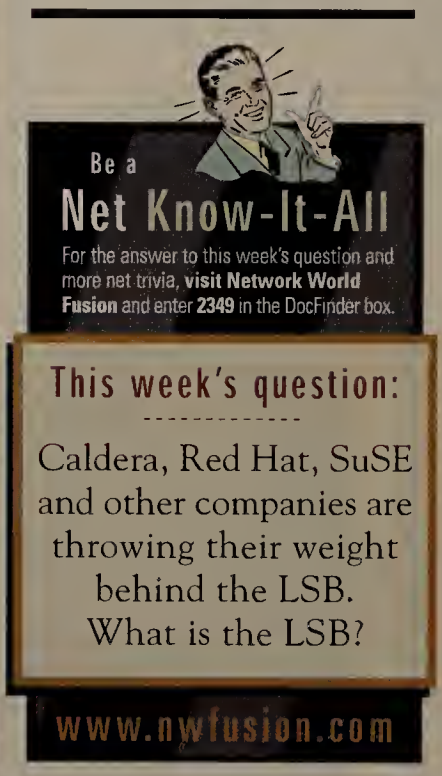
The problems were caused by a combination of apparently overloaded transport circuits in Qwest's intercity network and processing speeds on Qwest's Lucent frame/ATM switches that were too slow for the amount of user traffic coming such as SNA traffic, time out even though their PVCs were technically still up and running.

To fix the problem, Qwest literally forklifted out its Lucent frame/ATM switch in Los Angeles on Sunday, Jan. 22 and replaced it with a newer model. The company then changed the processing cards on the rest of its switches and lit three new OC-12 segments for use by frame and ATM customers.

No enterprise users reported to *Network World* that they saw their entire WAN go down. And it appeared that some Qwest customers got by totally unscathed.

But the incident — which Qwest is calling a series of "isolated service drops" — comes on the heels of ongoing complaints that Qwest has fallen behind on installation intervals and customer service because the company's sales force has generated loads of new customer traffic (*NW*, Nov. 8, 1999, page 1).

See **Qwest**, page 88



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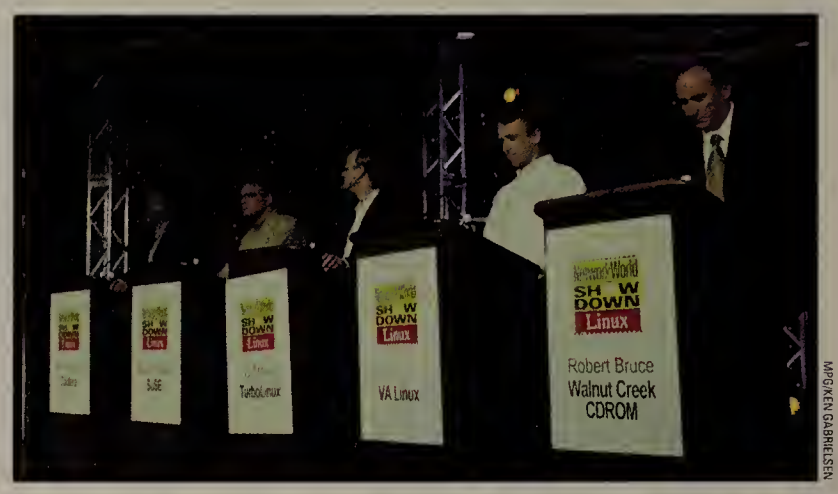
Linux debate sheds light on vendor strategies

BY APRIL JACOBS

NEW YORK — Last week's *Network World* Linux Showdown may have lacked the fireworks of recent political debates, but the event still shed plenty of light on the different strategies of the five participating Linux vendors and where open source software is headed.

Representatives from Caldera, SuSE, TurboLinux, VA Linux and Walnut Creek CDROM (market leader Red Hat declined to participate) came off more as friendly rivals than as fierce competitors during the debate, moderated by *Network World* Editorial Director John Gallant. The companies are spending most of their competitive energies trying to challenge Windows and Unix with their open source-based offerings.

Still, that didn't stop the participants from taking each other to task over issues such as delays in releasing source code; the scooping up of too much talent from the open source community; and the splitting of allegiances between Linux and other software, such as FreeBSD. Questions were also raised by audience members and a panel of industry watchers about Linux security and support for the Linux Standard Base (LSB).



Representatives from (left to right) Caldera, SuSE, TurboLinux, VA Linux and Walnut Creek faced off at *Network World's* Linux Showdown.

Brian Biles, VA Linux's vice president of marketing, was challenged to explain whether his company could support clustering across different operating systems, as does TurboLinux.

"Externally we work with a lot of different vendors, such as F5 Labs and Resonate — commercial vendors that provide load balancing around Internet clusters," said Biles, a last-minute substitute for company CEO Larry Augustin, who got tied up with VA Linux's nearly $1 billion acquisition of Andover.Net, a collection of Linux news and community Web sites. "Our systems include not only high-density rack-mount servers, but also software that facilitates management of clusters as an open source project."

The issue of keeping open source free was also a key theme. TurboLinux CEO Cliff

See **Linux**, page 90

IBM, SCO and others keep Linux momentum going

BY APRIL JACOBS

NEW YORK — Linux, with support from big vendors such as IBM and The Santa Cruz Operation (SCO), last week attempted to stick its foot a little further in the door of corporate America.

The LinuxWorld Conference & Expo featured the usual amount of Linus Torvalds worshipping and penguin paraphernalia, but the event also gave vendors an opportunity to introduce a slew of products designed to simplify the development of Linux applications and to make them easier to access from any net device. Also in abundance were new service and support offerings to help companies roll out Linux more quickly and broadly.

IBM made its presence felt by the sheer quantity of software and support announcements it made, including:

- ViaVoice for Linux, a new version of IBM's speech-recognition technology.
- IBM Network Stations running Linux, aimed at combining the benefits of open-source and thin-client computing.
- Contributions of critical skills and technology to the open source community for the development of a journaled file system. Such a system would protect the integrity of data during power outages by improving tracking abilities of users and giving them a way to retrieve data when a server fails.

Companies large and small showed off their open source software-based goods at last week's LinuxWorld.

- An application developer's kit with software aimed at accelerating the development of small-business applications for Linux.
- A Linux beta version of NetObjects TopPage, a Web authoring and page design tool that doesn't require in-depth technical skills.

Separately, SCO grabbed attention with news that its Tarantella product will support Linux beginning in the spring.

Tarantella gives browser-enabled PCs and thin clients access to applications on servers running a wide variety of operating systems, including Unix and Windows NT. Tarantella itself sits on a Unix server and acts as a gateway between heterogeneous clients and hosts.

SCO initially will add Linux support to Tarantella Express, which is for workgroup and departmental networks, with pricing starting at $745 for five concurrent users. Linux support will be added to the enterprise edition of Tarantella in the second half of this year.

Also at the show, Corel unveiled versions of its WordPerfect Office 2000 productivity software and a program to deliver turnkey Linux software and hardware systems to businesses. In addition, the company committed to delivering Linux services, including systems integration, custom application development and maintenance, and training.

Linuxcare, which specializes in Linux service and support, also expanded its offerings. The company said it will form strategic partnerships with hardware and software makers as well as ISPs to provide optimized versions of Linux distributions. The company named Informix and Hewlett-Packard as early members of its Custom Solution Service program.

Of course, no LinuxWorld would be complete without an appearance from Linux creator Torvalds, who kicked off the show with a generally upbeat keynote address on the state of the Linux nation.

However, he did tell the packed auditorium of Linux faithful that the next version of the Linux kernel, 2.4, will not appear until mid-year, or perhaps even later. Version 2.4, which will include improved support for multiprocessor machines and mobile devices, was expected out this quarter.

Others had better news, with members of the multivendor Trillian project announcing that they would release code to the open source community that enables Linux to be ported to Intel's IA-64 chip architecture. ◪

Find out what Intel and others are doing in the Linux arena. Page 24.

www.nwfusion.com

INSTANT REPLAY

Audio: Listen to the Linux Showdown from your desktop.

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Corrections

A recent company profile (*NW*, Jan. 3, page 8) incorrectly stated that Dell was the only vendor that had more than one product earn Network World Best of Test or World Class awards. In fact, Ganymede Software carries that distinction as well.

The total scores for the products reviewed for the desktop management Buyer's Guide (*NW*, Jan. 31, page 47) should have been listed as LANDesk Management Suite 6.3, 8.4; Desktop Management Suite 3.5, 7.45; NetWizard Plus 4.11, 7.35; ZENworks 2.0, 7.3; IT Director 2.1, 7.15; Systems Management Server 2.0, 7.0; and LANutil32 Suite 5.0, 6.45.

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MOTOROLA EMBEDDED SOLUTIONS

Windows 2000 only a first step for Microsoft

BY JOHN FONTANA

ANALYSIS

In October 1996, Microsoft's Jim Allchin began handing Alpha code to 3,500 developers for a product the company would unveil to the world as NT 5.0.

The code was intended to finally deliver the kind of scalable, reliable operating system Microsoft envisioned when it wrote the original New Technology OS/2 specification back in the late 1980s. But while the NT OS/2 specification made it to the Smithsonian Institution, its NT 5.0 spinoff endured a destiny of missed deadlines and intense scrutiny.

More than three years after Allchin's Alpha giveaway of what is now Windows 2000, Microsoft finds itself not at a climactic end but at an uncertain beginning.

The reason: Over the past three years all of network computing has fallen under the spell of the Internet.

Microsoft is now scrambling to position Win 2000 as a cornerstone of its future and reinvent itself as a provider of software services available over the Internet.

It is a future so littered with challenges that last month Bill Gates, who calls Win 2000 Microsoft's most important product ever, stepped down as CEO to lead the company's development efforts.

And it all starts with Win 2000, which ships next week. The operating system is the focal point of Microsoft's attack on the enterprise data center, e-commerce and application-hosting services.

"If Microsoft can establish Win 2000 as reliable and stable on the server side, it lets the company play in all these new environments more believably," says Dwight Davis, an analyst with Summit Strategies in Kirkland, Wash.

This means Microsoft will have to shake its reputation for server crashes, security bugs and product delays. And ultimately the company may have to deal with landscape-altering penalties in its ongoing antitrust case, which could lead to a breakup of the company.

First, it must win over the corporate data center where Unix and mainframes are king. Early reports indicate that Win 2000 has a shot, thanks in part to new support for clustering and symmetrical multiprocessing.

The real showdown issues, however, center on Active Directory and Kerberos. Both technologies replace glaring management and security weaknesses in NT 4.0.

"It's clear Active Directory and Kerberos are a big step forward for large networks to be built with Win 2000," says Tony Iams, an analyst with D.H. Brown in Port Chester, N.Y. "But getting your mind around that stuff is incredible. It's like 3-D chess. It will be ugly."

After the enterprise, it may only get tougher as Microsoft tries to convince a cynical industry that Win 2000 can handle the demands of the Web and e-commerce.

The operating system is the core of Windows Distributed Internet Architecture 2000 (DNA), a Web development platform announced in September. But delivery of the platform's components, including a key XML server called BizTalk, is lagging, and Microsoft must deliver soon or

See **Win 2000**, page 90

Two takes on Windows 2000

Don't underestimate this upgrade.

"The preparation requirements are much more daunting with Windows 2000, and having access to people involved in early deployments will be critical."

Rob Enderle, Giga Information Group

The big change is Active Directory.

"Bottom up, decentralized deployment of Active Directory will create incongruous namespaces and security practices that will be hard to change later."

Dan Blum, Burton Group

Go online to read the complete columns, www.nwfusion.com, DocFinder: 6734

WarpSpeed introduces hands-off T-1 provisioning

New service lets network devices decide when to set up and tear down bandwidth.

BY TIM GREENE

PLEASANTON, CALIF. — WarpSpeed next week is announcing that its customers won't have to lift a finger when their networks need extra bandwidth.

Instead, within seconds the firm's Bandwidth@WarpSpeed service will respond automatically to requests for additional T-1 lines as the requests are generated by servers, routers and policy management software in customer nets.

The automation of Bandwidth@WarpSpeed makes the service suitable for disaster recovery, says Joseph Baylock, group vice president at Gartner Group. If a site's main circuit goes down, WarpSpeed can back it up before a network administrator has the chance to intervene, he says.

In addition to supporting backup, the service makes low-use applications such as videoconferencing affordable, says Larry Bridges, CEO of Red Car, a film editing company.

Much of Red Car's editing is done in Los Angeles, but clients in Dallas often want to see and hear editing changes before signing off on projects. Using a Bandwidth@WarpSpeed T-1 only as needed makes it possible for editors and clients to collaborate without flying back and forth, Bridges says. A dedicated T-1 from Dallas to Los Angeles was too expensive.

To set up the service, WarpSpeed installs a T-1 circuit to a customer site. The line is idle until a customer calls on it. Then messages sent from devices in the customer's network bring up the line.

To use this automatic feature, customers must install XML scripts in their policy applications. When policies determine network conditions require an additional T-1, the XML script sets up a Web connection to the provisioning platform in WarpSpeed's network. WarpSpeed then sets up the requested connection within seconds, the company says.

For example, if a policy calls for an extra T-1 whenever the primary T-1 reaches 90% capacity, router congestion will cause the network policy manager to execute the XML script that sets up the backup T-1. A policy that reverts to one T-1 when total congestion drops below 45% will prompt a script to cancel the backup.

Customers can download sample scripts from WarpSpeed's network to simplify the process. They pay a flat $500 fee per month plus $1 per minute when a T-1 is being used 6 a.m. to 6 p.m., and 50 cents per minute at all other times. WarpSpeed bills are based on the time zone from which the request is generated.

In addition to being on-demand, a Bandwidth@WarpSpeed T-1 network can be meshed using fewer access lines than a conventional T-1 network. With WarpSpeed, each customer site can be connected to WarpSpeed's network via a single T-1, and can reach any other customer site. In a conventional network, each site would require a separate T-1 to connect with each other site.

WarpSpeed: www.warpspeed.com

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NW responds to NOS flap

BY CHRISTINE BURNS

Our comparative review of Microsoft's Windows 2000, Novell NetWare, Red Hat Linux and The Santa Cruz Operation's (SCO) UnixWare (*NW,* Jan. 24, page 71) struck a nerve with our print and online readers.

The online story has received tens of thousands of hits, the accompanying online forum is home to a raging debate, print readers have been sending in letters to the editor (see page 56), and even "Backspin" columnist Mark Gibbs added his two cents (*NW,* Jan. 31, page 81).

While we have responded to many issues raised by readers online and in print, we thought it would be helpful to pick out some of the key concerns and summarize our responses.

The point of our review was to look at these products within the parameters of the test bed we designed, and let the chips fall where they may. Our goal was twofold: We wanted to provide performance benchmark results for each network operating system (NOS) and then round out those hard-and-fast numbers with a subjective review of the features supported by each product.

We took a few lumps regarding the performance numbers. There was some confusion regarding a spreadsheet detailing our benchmark results that we posted in error; we fixed that.

But some readers who poured over our detailed benchmark results have suggested that if we had sliced and diced the numbers differently, Novell would have made an even stronger showing as the top performer in our file and network tests.

The results might, in fact, change if we tested with more clients, but author John Bass notes that the tests caused the server's processors to approach 100% utilization (it's usually between 93% and 98%), so it's doubtful the servers could do much more.

Most of the issues raised were in response to our subjective review of features. Readers questioned why we examined products that aren't yet available, said we examined the wrong things and challenged the way we weighted the various feature categories. While it probably won't douse the debate, here is some background on the thinking that went into our decisions.

Shipping products

Readers asked how we could compare established products, such as NetWare, to Win 2000 when the latter won't be generally available until the middle of this month. We set out to test the most up-to-date version of each product to give readers who have not had the opportunity to work with them a hands-on evaluation of the products.

We gave all the vendors the opportunity to submit non-shipping versions of their products if they could deliver final, or gold, code. In addition to Microsoft, Novell and SCO took us up on this offer. We tested NetWare 5.1 and UnixWare 7.1.1 in December before those versions were generally available.

What's with the weighting?

Some readers took issue with how we weighed the individual categories in the test, questioning, for example, why our performance benchmarks comprised only 25% of the total score. The weighting scheme, which has been used in past NOS reviews, is based on surveys in which we asked users to rank the NOS features that are most important to them. Of course, you may want to change the weightings to reflect the needs of your environment.

Scalability, security and reliability

Still more readers questioned our understanding of what these three terms mean in a real-world environment. We could have been clearer as to what we examined when handing out scores in these categories.

We know NetWare has earned the U.S. government's C2 security certification, that SCO publishes data that shows the average time between software stops is more than 12,000 hours, and that an ideal measurement of NOS reliability is whether a server can stay up and running for years at a time. However, we had to look at these products within the confines of our test environment.

While we knew, for example, that Novell has publicly demonstrated that its directory service can scale to accommodate more than a billion objects, for the purposes of this review, our scalability weightings were based on symmetrical processing support, how well the management tools were equipped to scale in an enterprise environment and what kind of clustering services were supported.

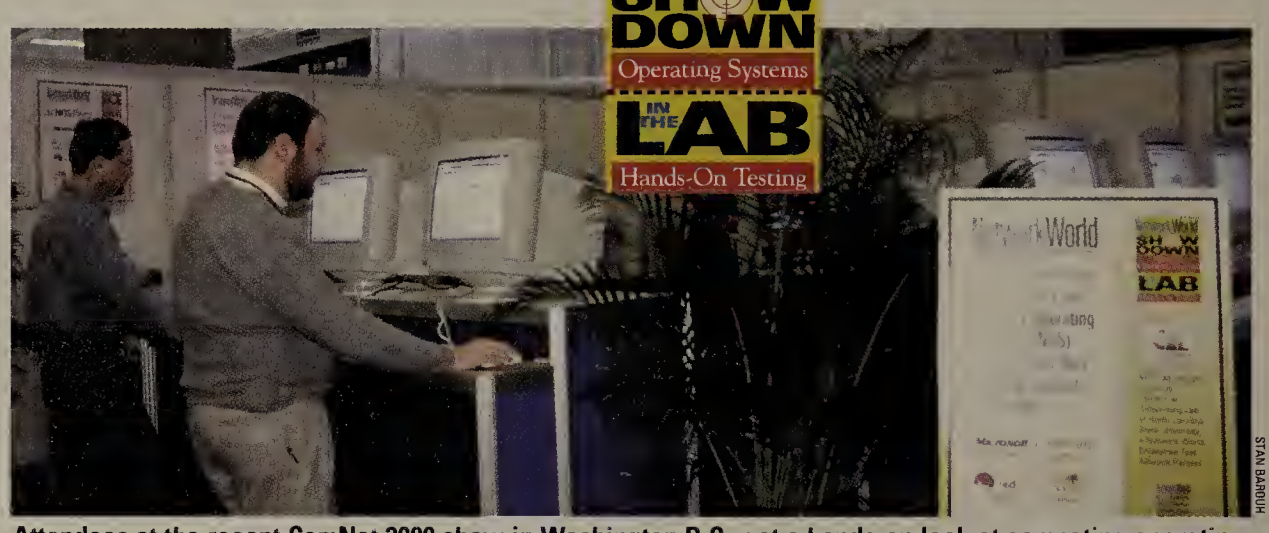
Is that all there is to know about scalability? No, but then again, we didn't set out to push the scalability limits of each NOS. The score for this section was based on an evaluation of just those items identified.

Likewise with security. The factors weighed in our score were authentication mechanisms, network and file encryption support, and security configuration and management tools. Whether a product has C2 certification intentionally had no bearing on the score.

On the reliability front, our eight-week testing cycle logistically barred us from keeping these servers running for hundreds of days. So the reliability criteria we could practically rate were: under what conditions did we have to reboot the system during our testing cycle; what tools were available for backing up and restoring a downed system; and what level of memory protection did each NOS offer.

As the original story said at the very beginning, the best product for you "all boils down to what you're looking for in a NOS." This and all other reviews have to be taken with a grain of salt because, of course, the way we prioritize a product's characteristics will be different from how you would weigh them, and our test environment will not exactly mimic yours.

We appreciate all comments — positive and negative — and will take your thoughts into consideration in future reviews. ◪



Attendees at the recent ComNet 2000 show in Washington D.C., got a hands-on look at competing operating systems in our NOS Showdown Lab.

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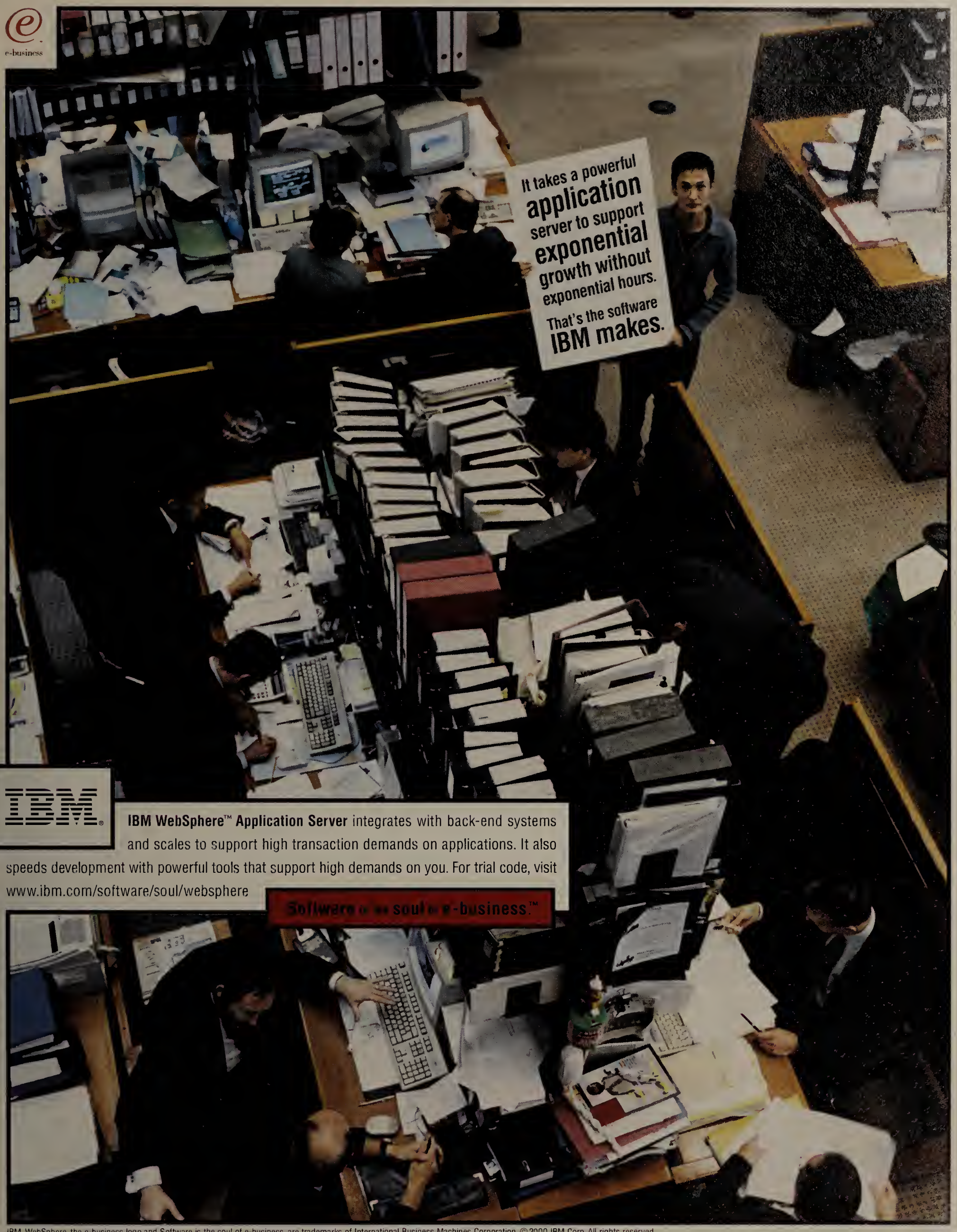

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Bell Atlantic offers to sacrifice GTE's Internet unit

BY DAVID ROHDE AND TIM GREENE

WASHINGTON, D.C. — Bell Atlantic and GTE, still seeking government approval for their merger, have told regulators they are willing to sell off GTE's Internet unit, but they want to do it in a way that has leading critics of the merger calling the proposed sale a sham.

As part of the sale, the two companies want to keep a marketing tie with GTE Internetworking that critics say defeats the whole purpose of selling it off — to keep Bell Atlantic from owning an Internet backbone before it has full long-distance authority.

And as a result of the new controversy, the merger might now occur without one of the benefits that the merging carriers originally claimed for the deal: the ability to put local loops and high-performance IP network services together in one carrier's package.

Since 1998, Bell Atlantic has said because GTE Internetworking offers Internet access, virtual private networks (VPN) and Web hosting, the merger is uniquely beneficial for users in Bell Atlantic's and GTE's respective local service territories.

Quietly grown closer

In fact, Bell Atlantic and GTE officials confirm that over the past few months, they have quietly developed some co-marketing arrangements even before a merger closing. For example, at the recent ComNet 2000 show in Washington, D.C., displays at Bell Atlantic's booth indicated that the Bell Atlantic Data Solutions Group is selling GTE Internetworking's VPN and Web hosting services, complete with security features and service-level agreements.

But on Jan. 27, after months of preliminary negotiation with the Federal Communications Commission and help from lobbyists such as former FCC Chairman Richard Wiley, Bell Atlantic and GTE formally proposed to the FCC to sell 90% of the stock in GTE Internetworking to the public in order to close their merger. Yet the same proposal stated that the merged company will continue to "market" GTE Internetworking services.

Former FCC head Wiley helped push the proposal to sell GTE Internetworking.

String attached?

Opponents of the merger, namely competitive local carriers and long-distance companies, say that amounts to a big string attached to the sale.

"If GTE Internetworking is really going to be independent, then how does Bell Atlantic know they're going to continue to have a marketing agreement with them?" fumed one such opponent, who asked not to be identified.

Bell Atlantic officials say they're not trying to pull a fast one. Because 90% of GTE Internetworking's stock will be out of Bell Atlantic's hands, it's true that Bell Atlantic couldn't stop GTE Internetworking from doing what it wants, concedes Don Evans, Bell Atlantic's vice president of federal regulatory matters.

"But we're hopeful that this [marketing arrangement] is going to keep on going," Evans says. "We are not planning on it falling apart."

Besides, Evans notes, Bell Atlantic and GTE do have to propose some sort of new status for GTE Internetworking because of telecom regulations. As one of the original regional Bell operating companies, Bell Atlantic is generally prohibited from carrying long-distance traffic, while GTE — even though it is as much or more dominant in its territories than Bell Atlantic is — has no long-distance prohibition. Because any merged company that includes one RBOC automatically becomes an RBOC itself, the merged Bell Atlantic/GTE will have long-distance restrictions. And GTE Internetworking, which operates the nation's fourth-largest Internet backbone, is considered to be a long-distance carrier.

So far, Bell Atlantic has only won long-distance authority for one of its states: New York. Under the Jan. 27 proposal, Bell Atlantic will have the right to buy back GTE Internetworking once it receives long-distance authority for most or all of its states. Evans says he hopes the FCC will allow Bell Atlantic to buy back GTE Internetworking once it has long-distance authority for all its states except Maine and West Virginia.

Those states either do not have GTE Internetworking facilities or can arrange to have GTE traffic bypass them, Evans says. ◪

More **breaking news**

Network World Fusion now has more news than ever. Check out these stories online:

Crackers try to blackmail Visa

Here's a wild one. A bunch of crackers stole information from Visa servers and half a year later tried to blackmail the credit card king. Visa's answer — no dice! **DocFinder: 6740**

Microsoft issues fixes for Win 2000 security holes

Do you want to know why Windows 2000 still isn't formally shipping? Because Microsoft is still busy plugging security holes, that's why. The company recently found, and patched, two holes in the Microsoft Index Server search engine. If left unfixed, hackers could view Web server files or discover the physical location of Web directories. **DocFinder: 6741**

Start-up looks to reinvent surfing the Web

The Web is pretty cool, but one of its downfalls is its very randomness. You click forward, you click backward, you click this link, you click that link. There is really no rhyme or reason.

Well, SpotOn aims to change all that with a pretty cool new tool. Web site owners can license the software and use it to help surfers navigate. Now instead of just "Forward" and "Backward," surfers can click "Next." This new key will take them to the next screen that the Web site operator has chosen — kind of like a guided tour. **DocFinder: 6742**

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HP OpenView finds strength in numbers

BY JEFF CARUSO

PALO ALTO — In an effort to give IT managers a more complete view of their enterprise networks, Hewlett-Packard this week will combine its operations and performance management tools, and add new automated functions into the mix.

The new family of software, called OpenView VantagePoint, can automatically find a new server as it is added to a network, find out what services and applications are running on the server, and set up policies to monitor and manage those services.

Tools in the VantagePoint family also can adjust how much information they collect from software agents distributed around a network — so if a problem is detected, they can start collecting more data. VantagePoint includes the products formerly known as IT/Operations, PerfView and Service Reporter, among others. Companies can install a version of VantagePoint tailored toward operations, one looking just at performance, or both.

OpenView's IQ

Hewlett-Packard built what it calls "intelligence" into its new OpenView VantagePoint software, including:

- Instant intelligence: Automatically discovers servers and applications as they are installed on a network.
- Active intelligence: When a problem is detected, software agents automatically start gathering more data.
- Business intelligence: Shows how business services are affected by network and system problems.

Versions will run on HP-UX, Sun Solaris and Microsoft Windows 2000, collecting data from HP agents using Simple Network Management Protocol. The software also will collect data from any agents that use the Windows Management Interface.

The bundling of systems and application management across different operating systems appeals to Dean Haneoek, application and network administrator at Pacific Coast Building Products in Sacramento, Calif., which plans to install VantagePoint. "There's never been a single solution for all those things," he says.

HP is in step with many other management software vendors, which are moving

See **OpenView**, page 90

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From the top: Novell CEO Eric Schmidt

Novell CEO Eric Schmidt this week will attempt to take the network software industry's center stage — with a large product splash of his own — a week before Microsoft officials do the same with the launch of Windows 2000. Schmidt, who is expected to outline a series of new technologies involving everything from directories to net management to e-commerce, spoke by phone last week with Network World *Senior Editor Deni Connor.*

How is Novell exploiting the fact that Novell Directory Services (NDS) is a more mature product than Microsoft's Active Directory?

You are assuming that Active Directory is a real product. It hasn't shipped yet, but we're told it will ship soon. Once it ships, we have committed to fully interoperate with it. We have a technology that allows you to mix and match [servers and workstations] as needed. Most people will use NDS for corporate and backbone directories because it runs on more than just Windows 2000.

What is that technology?

The technology is DirXML. We announced it last summer, and it is available now. It allows you to combine directories in interesting ways. We did that to make sure that if people made an NDS decision they could use whatever other applications or directories are floating around. There are a bunch of DirXML products available now — for Lotus Notes, Oracle and PeopleSoft.

When pitching a big Windows NT shop on NDS, how do you attempt to separate NDS from NetWare in the minds of their network executives?

NetWare and NDS are different products. They do different things. NDS is a product that runs on top of Windows NT, NetWare, Linux, Solaris and OS/390. I am aware of companies that have a large amount of Windows NT servers, but they also have a large number of Unix servers and mainframes, and NetWare servers. We have a variety of products that match those environments. With respect to NDS, it's a different type of sale. It's how NDS can help you integrate all your management and directory needs and corporate Web pages. These days, we start with NDS. When the customer understands NDS, we end up selling NetWare, as well as NDS running on top of Windows NT and Windows 2000. The strategic sale is the directory.

STAN BAROUH

What is Novell doing to stem the tide of users moving from NetWare to Windows NT?

There are situations where applications are available on NT and not on NetWare. Windows NT and NetWare are focused on different things. We want to make sure people understand the benefits of NetWare. We have shipped NetWare 5, and it has been successful.

What is Novell's plan to attack the e-commerce market?

We have a product called eDirectory, which we announced in November [1999]. [This week] we will announce products that run on top of eDirectory that allow you to see all your applications as though they are one.

See **Schmidt**, page 88

Novell,

continued from page 1

hardware and meter software for license compliance. ZENworks for Servers applies similar functionality to servers.

ZENworks for Networks will let net managers apply QoS practices and policies to switches and routers that are NDS- or Directory Enabled Network (DEN)-compatible.

DEN, a specification developed by Microsoft and Cisco that was adopted by the Desktop Management Task Force, envisions the integration of directories and network hardware to provide better network performance, management, security, reliability and QoS. The first switches and routers that work with ZENworks for Networks include products from 3Com, Lucent, Extreme Networks and Cisco.

These announcements are important to Novell because directory-enabled applications such as ZENworks and ManageWise account for more than 25% of the company's revenue and are its fastest-growing class of products.

Novell customers are pleased with how they see ZENworks evolving. Jim Stalewski, computer operations manager at M.W. Kasch Co. in Mequon, Wis., foresees ZENworks for Servers and ZENworks for Networks being useful in his shop.

"The first would help with application rollouts and service packs across the WAN," Stalewski says. "The second would finally give us the much-talked-about, but not yet seen, NDS-based network policy management, which would be useful to guarantee that certain users get enough bandwidth."

Another customer is equally enthused about Novell's plans.

"ZENworks does precisely what the administrator is looking to do," says Brian Rossner, network specialist with construction materials company USG in Charlestown, Mass. "The ability to better manage my servers, routers and switches by assigning bandwidth is something I have been looking for quite some time."

Rossner has been using ZENworks for Workstations to manage the configurations of his desktop machines.

Stalewski, however, does have one bone to pick.

"The only rub is that Novell will probably license them separately instead of rolling them into the existing ZENworks product," Stalewski says. "It would be nice if they'd do that and call it ZENworks 2.5."

The products are, indeed, being sold separately.

By tying server and network management to NDS, administrators can be more productive, according to a study from market research firm International Data Corp. (IDC) of Framingham, Mass. "Network managers can centrally manage distributed resources and automate such functions as applying QoS and user-access policies to network devices," says Rick Villars, an analyst with IDC.

ZENworks, present and future

Novell has introduced two new ZENworks that expand the company's end-to-end network management product.

New products:
- ZENworks for Networks
- ZENworks for Servers

Current products:
- ZENworks for Workstations
- ManageWise
- Net Publisher
- NetWare Enterprise Print Services

Future products:
- ZENworks for Linux
- ZENworks for eCommerce

With ZENworks for Networks, net managers can gather network management statistics and monitor network protocol and application traffic. The product can also be used to configure routers and switches, and assign bandwidth to specific users or application. For instance, customers may create a policy that allows users attached to specified ports on a switch to receive priority to applications over other users.

Using ZENworks for Networks, an IS director at a large Midwest hospital chain plans to monitor unauthorized equipment moves in much the same way the hospital now monitors software on workstations.

"It will allow me to plug this workstation into this port and only this port on a Cisco or 3Com router," says the director, who requested anonymity. "This is one more security level for us."

ZENworks for Servers lets network managers automatically distribute files, support packs and applications among servers using NDS. Dubbed "tiered electronic distribution," the software can be used to ensure uniformity of server software and save time for administrators who will no longer have to roam from one server to another.

When changes are made to the server designated to distribute software, they will be distributed and updated on all appropriate servers and NDS objects.

The product can also be used to optimize available bandwidth by automating scheduled replication and synchronization during off-hours, thus lowering WAN costs.

ZENworks for Servers and ZENworks for Networks are managed through Novell's ConsoleOne management utility. ZENworks for Servers supplements many of the features of Novell's remote monitoring utility, RCONSOLE, and services found in Novell Replication Services (NRS). NRS is software that automatically copies data and documents from server site to server site.

Novell declined to comment on prices, although sources say ZENworks for Servers will be licensed for $75 per user, and ZENworks for Networks will cost $70 per user. ZENworks for Networks is available now, while ZENworks for Servers will be available later this month. ◪

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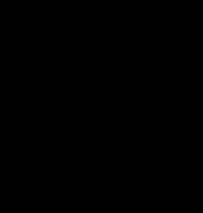

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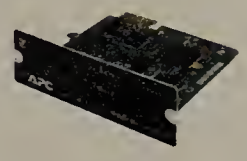

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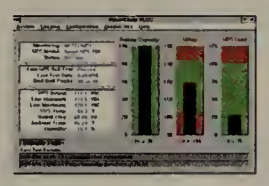

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- James Whitaker, Novell Architecture and Design Engineer, Tom Schmidt, Novell Host Server Architect, Troy Sims, Novell Host Server Architect

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Nokia buys VPN gear and more with purchase of Network Alchemy

BY TIM GREENE

Nokia will soon be the proud owner of virtual private network vendor Network Alchemy and has big plans for the start-up's technology that go far beyond VPNs.

Nokia said last week it would buy the 2-year-old Network Alchemy for $335 million and use the firm's patents and core technology to develop e-business hardware.

Network Alchemy makes CryptoCluster servers that can handle 20,000 simultaneous VPN connections. The servers can also load-balance Internet traffic and if one CryptoCluster fails, another can pick up all its sessions.

The acquisition gives Nokia high-end VPN gear to augment the VPN hardware appliances the firm sells to branch office and individual users. These devices run VPN software from Check Point Software that sets up VPN sessions and encrypts VPN traffic.

In addition, Nokia will use the underlying fault-tolerance and failover capabilities built into the Network Alchemy operating system to develop other devices for service provider networks. Nokia did not specify what gear it will apply the technology to, but company officials say these new products will support secure and reliable online business services.

Customers using Network Alchemy gear will continue to receive support for CryptoCluster servers, Nokia says.

That is not a worry for Network Alchemy customer Dave Ploch, director of technical architecture for food technology giant Monsanto in St. Louis. He says CryptoClusters were a short-term solution to create VPNs for site-to-site connections within Monsanto and between Monsanto and its partners.

Ploch says he expected VPN start-ups to get swallowed up by bigger network companies. It has happened to other start-ups (see graphic), and this trend means the popularity of VPNs will skyrocket, predicts Jeff Wilson, a VPN analyst at Infonetics Research.

Cisco's purchase last month of two VPN vendors — Altiga Networks and Compatible Systems — was particularly significant. "End users were waiting for Cisco to decide what to do," Wilson says.

Cisco had promised to put VPN capability in its IOS router software, but its new strategy is to use separate VPN hardware. That will prompt Cisco users to go ahead with hardware-based VPN plans, Wilson says. ◩

Gotta have a VPN

Network companies snapping up VPN expertise include:

Buyer	Company bought	Price (in millions)
Cisco	Altiga	$567
Newbridge Networks	TimeStep	Undisclosed
Nokia	Network Alchemy	$335
Nortel Networks	New Oak	$156

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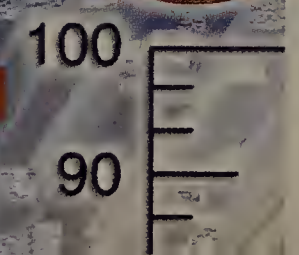

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Briefs

Cisco last week announced new modules for its multiservice 2600/3600 routers. The four new modules offer two WAN Interface Card ports that Cisco says operate up to 8M bit/sec and support integrated DSU/CSU serial connections. The modules offer a choice of one or two 10/100 Ethernet LAN ports and/or a 4/16M bit/sec token-ring LAN port all on one network module. Previously, the same features were only available using two or more network modules. The new interface cards are available immediately. The new modules range in price from $1,500 to $3,500.

Cisco: www.cisco.com

Netscreen Technologies has cut the price of its 10-user NetScreen-5 Internet virtual private network appliance from more than $1,500 to about $1,000. The box performs hardware-based encryption and IP tunneling. The box also acts as a firewall for branch and telecommuter offices. The company has also introduced a 25-user version of NetScreen-5, which costs about $1,800.

Netscreen: www.netscreen.com

Looking to speed e-business services for users, **IBM** and content handler **Akamai** have inked a deal. Last week, IBM announced it will use Akamai's FreeFlow high-speed Internet service to offer a set of systems integration and application development services to speed and more smoothly handle Web site traffic.

Akamai says FreeFlow lets Web sites handle streaming media, animation, photo montages and 3-D objects more efficiently. Akamai also announced it will make IBM's Netfinity PC server running Linux its Web server of choice.

Akamai: www.akamai.com; IBM: www.ibm.com

IBM turns up pervasive computing heat

Company offers variety of products and services to link Internet appliances with enterprise nets.

BY MARC SONGINI

ARMONK, N.Y. — Is your car IP-Java-enabled? It may be soon, courtesy of IBM.

The company has initiated a multipronged attack with its hardware, software and services units to build systems and offer programs that let customers tie Palms, smart phones and other appliances to enterprise networks to exchange data and execute business transactions.

IBM even supports the Automotive Multimedia Interface-Collaboration, the body overseeing the Java-based communications protocols that let a car's diagnostic, safety and navigational systems share information over a network.

IBM is looking to tap a huge opportunity in the pervasive computing arena, which will be worth $120 billion by 2003, IBM says.

Stiff competition ahead

However, the company faces tremendous competition in this area. For instance, Motorola and Nokia are vying for the smart phone end of the business. Microsoft has its Windows CE operating system for handheld devices. For services, companies such as EDS are offering packages that integrate various types of devices with enterprise networks.

IBM also faces a customer perception issue, analysts say.

In the pervasive computing arena, IBM seems to be interested in being a service provider more than anything else, says Ken Dulaney, analyst with Gartner Group, a consultancy in Stamford, Conn. He claims IBM's enterprise customers don't associate the company with any specific line of mobile or handheld computing products as they would with Nokia and its smart phones and services.

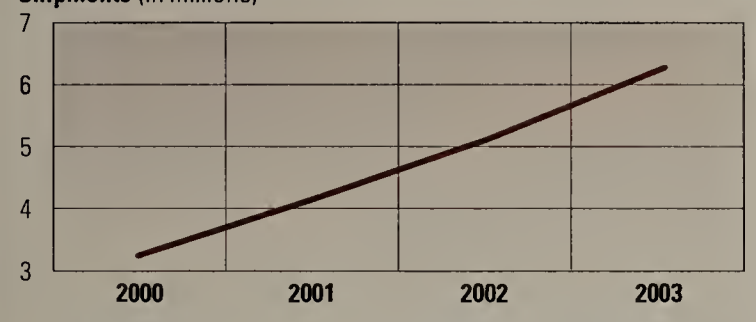
For instance, IBM licensed the Palm from 3Com and sold it as its WorkPad, but the marketing effort languished and most customers don't even know IBM offers it, Dulaney says.

To succeed, IBM should be clearer about its specific products and must continue to develop middleware that will allow all devices — regardless of wire speed or operating system — to execute standardized transactions with corporate nets.

See **Pervasive**, page 28

IBM's PDA plan

With the expected increase in small computing devices, such as personal digital assistants . . .



. . . IBM envisions a world where handheld computers, cell phones and other mobile devices are all hooked into a central network. To meet the demand, IBM will offer:

Product	Description
MQSeries Everywhere	Lets handheld appliances directly message network applications.
Transcoder	Shrinks Internet data to fit it into handheld devices.
IBM NuOffice	Allows mobile users to access documents from any location.

Microsoft, others target Kerberos interoperability

CyberSafe, Gradient and ActiveTrust line up to close Windows authentication gaps.

BY JOHN FONTANA

Enterprise customers hoping to build interoperability between Windows 2000 and their established Kerberos installations are finally beginning to get some help.

Microsoft and other security vendors, such as CyberSafe, are starting to develop technology that could establish interoperability between standard implementations of Kerberos Version 5 in Win 2000 and Unix-based implementations of the authentication protocol. That interoperability could let enterprise customers build large-scale cross-platform Kerberos infrastructures.

Kerberos is a standard security mechanism that makes users prove who they are before they can gain access to network resources. Microsoft is supporting the protocol for the first time in Win 2000, but there have been questions about its interoperability with other Kerberos environments, especially those running on different platforms.

"What we're talking about are interoperable security credentials," says Chris Christiansen, an analyst with International Data Corp., a market research firm in Framingham, Mass. "You need to create a bridge to support a heterogeneous environment, and that's something Microsoft doesn't do."

A plan in place

Microsoft and CyberSafe have set out to address that problem. The two are working together to prove that CyberSafe's ActiveTrust software can establish a connection, or trust, between Win 2000 and other Kerberos environments. The trust would allow Windows clients to authenticate to non-Windows servers and non-

See **Kerberos**, page 28

10:59:34

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Intel investments invigorate Linux offerings

BY PHIL HOCHMUTH

Intel's recent investments in several Linux companies, and the firm's strong involvement in the Linux community, will be increasingly important in growing hardware support for the operating system.

The investments will also make Linux a more palatable option for enterprise network customers.

Over the past several months, Intel has made investments in Linux companies, with a portfolio that now includes top Linux distributors Red Hat Software, SuSE, TurboLinux and server manufacturer VA Linux Systems. The company also works closely with the Linux community to ensure that Linux is not only compatible with, but also optimized to perform on Intel's current and future processors.

"We work quite closely with the whole Linux community to make sure their software is tuned properly for when Intel comes out with new processors and platforms," says Victor Krutul, manager of operating system programs for Intel.

"We understand and work with the whole community, and we work with many individuals, as well as the distributors and the OEM sector," Krutul says. "We give individuals in the Linux community advanced copies of our specifications for new chip designs, processor simulators and other tools to help them develop software."

This is a different scenario than when Linux first emerged several years ago, when the open source community worked mainly from the outside on getting Linux to be optimized on the Intel platform, among others, Krutul adds.

An example of this expanded collaboration is the Trillian project, an effort to prepare Linux for the release of Intel's 64-bit Itanium processor, due out this year. The project, which was started almost 18 months ago, includes companies such as IBM, Hewlett-Packard, Silicon Graphics, VA Linux Systems and Red Hat.

Having Intel behind Linux development will be important to spark hardware vendors to supply more Linux-compatible device drivers for their products, some users say.

"The more hardware compatibility Linux users get, the bigger Linux can become," says Maurice Smiley, a systems administrator at Gulf Interstate Engineering, a Houston firm that designs equipment for the gas and oil industries. Smiley, who uses Intel and Power-PC-based Linux servers for file serving and Web hosting, says the lack of available hardware drivers is a problem for users.

"Most Linux drivers are reverse engineered by individuals," for common server components such as hard drives, network interface cards and RAID controllers, Smiley says. "It would be really nice if these hardware manufacturers made more drivers for Linux. I can see Intel being the catalyst for that. If Intel started supporting Linux more wholeheartedly, then other manufacturers would get behind that and it would really take off."

Additionally, Intel's backing of Linux will help the operating system be more cutting-edge, rather than just a reliable "old stand-by" for file and print serving, says Enoch Moeller, MIS director with ECandle Corp., an online retailer of candles and other home goods.

"The Linux distributions out now are behind on some more advanced stuff, such as Universal Serial Bus (USB), certain kinds of storage media and some higher-end network cards," Moeller says.

Moeller also likes Intel working closely with Linux developers on more advanced projects, such as Trillian.

"Linux on the IA-64 should have more core-level support for the new chipset than it originally did" for the IA-32 processor, due to Intel's efforts, Moeller says. "It will also let Linux take advantage of chipset features more readily from when the chip is released."

While Intel's relationship with the Linux community and vendors is strong, Intel's Krutul emphasizes that overall, Linux is just another operating system the chip maker supports.

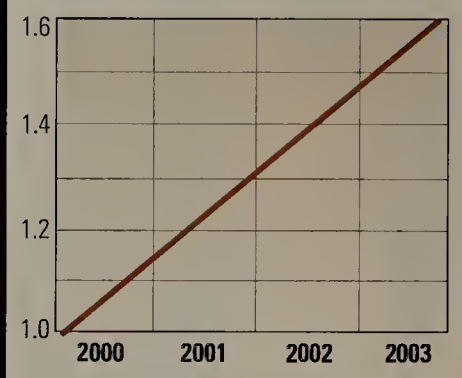
According to analysts, though, Intel's involvement with Linux could be perceived as a little more than just covering its operating system bases.

"Intel just wants to encourage the use of its processors," says Dan Kuznetzsky, an analyst with International Data Corp. in Framingham, Mass.

However, Kuznetzsky adds, Intel doesn't mind separating itself from the "Wintel" label whenever possible, and Linux presents a good opportunity for that. "If Intel's involvement with Linux has that side effect, I'm sure that's OK with them," he says. ◪

Linux installs to grow

The number of installed Linux server operating systems is expected to climb steadily over the next several years, with most of the systems being Intel-based.



SOURCE: IDC, FRAMINGHAM, MASS.

Network storage vendors take to Linux

BY DENI CONNOR

NEW YORK — A slew of hardware products introduced at LinuxWorld Expo should help users more easily store data in mixed Windows NT, Unix and Linux environments.

Last week LAND-5, Overland Data, MTI and ADIC announced products ranging from network-attached storage (NAS) appliances and tape libraries to RAID systems aimed at midsize to large enterprise customers.

"In e-commerce, application hosting and Internet applications, we needed an enterprise-class storage offering that was scalable across a number of operating system platforms, including Linux, Solaris and Windows NT," says Bob Johnson, a director at application service provider Breakaway in New York.

Taking multiplatform requirements seriously, LAND-5 rolled out the Linux-based iCEbox StoragePod. The Pentium III NAS appliance offers up to 4.5 terabytes of RAID storage, which can be accessed by Linux, Unix or Windows NT clients. It supports RAID Levels 0, 1, 0+1, 4 and 5.

The StoragePod appliance uses browser-based software RAID technology that allows increased performance over hardware-based RAID. It uses the system CPU, which is otherwise idle, to increase processing power.

Available in a rack-mounted configuration, StoragePod connects to 10/100 Ethernet, Gigabit Ethernet or Fibre Channel networks. Fans, power supplies and drives are all hot-swappable. The iCEbox StoragePod with three 9G-byte Ultra2 SCSI disk drives starts at $8,000. It will be available this month.

By 2003, nearly 25% of server appliances will run Linux, according to International Data Corp. in Framingham, Mass. Today, Linux server appliances account for 14% of the appliance market. Linux is lightweight and inexpensive, making it a good operating system to ship embedded in NAS devices, says Dave Hill, an analyst with Aberdeen Group in Boston.

Traditional storage device vendors are also adopting Linux. Overland Data announced that all its AIT and Digital Linear Tape (DLT) libraries now support Linux. Previously, they operated on Windows NT and Unix platforms. The company's tape libraries support capacities of more than 8 terabytes. Data can be backed up to the tape libraries using Linux versions of Legato Networker, Veritas NetBackup, Knox Software's Arkeia or UniTrends Software's CTAR.

LAND-5's Storage Pod appliance supports up to 4.5 terabytes of storage.

Finally, MTI added Linux support for its midrange to high-end Vivant RAID subsystems and storage data services, which operate on Windows NT and Unix networks.

The Vivant system consists of connectivity for Fibre Channel storage-area networks, NAS, backup, replication and management services and are built around Caldera's OpenLinux technology.

ADIC will also introduce a SAN data-sharing product, dubbed Centravision, in March that lets people share data over a Fibre Channel SAN between Windows NT, Linux, NetWare and Unix server-based networks. ADIC's DLT, AIT, 4mm Digital Audio Tape drives and libraries already support Linux. The company's products operate with Veritas and Legato backup software.

LAND-5: www.land-5.com; Overland Data: www.overlanddata.com; MTI: www.mti.com; ADIC: www.adic.com

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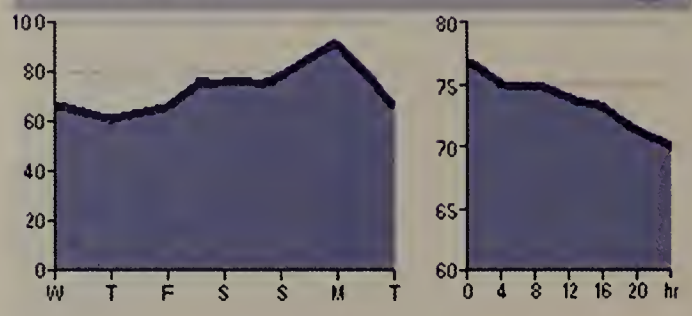
Credit authorization	eCommerce	1,320	1,600

LAN Quality Index



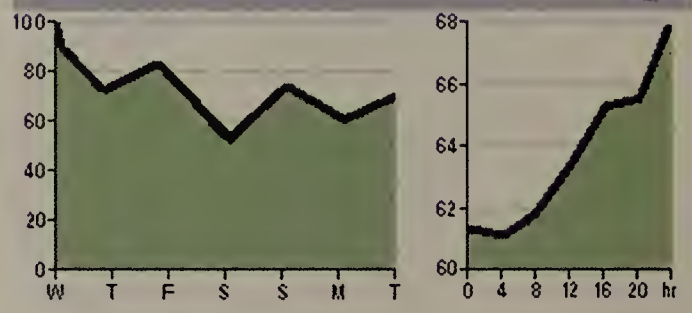
My Applications and Services
AVAILABILITY

Application	LAN	D
Order tracking	98%	1
Customer Billing	62%	
B2B Procurement	58%	
Online Store	100%	
Sales Order Processing	100%	

Application Leaders
AVAILABILITY — DIAL UP

Application Name	Last week	2 weeks ago
SAP	87.4%	13.8%
PeopleSoft	68.3%	2.5%
Email	54.3%	8.2%
Web	45.2%	4.3%
DNS	17.8%	2.7%

WAN Quality Index



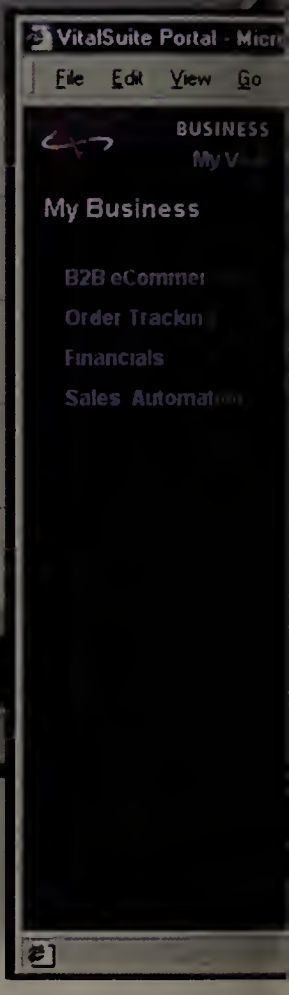
Router Leaders
PEAK UTILIZATION

Router Name
HQ Campus BB R2
HQ Campus BB R5
Seattle Branch R1
New Jersey Branch R6
Atlanta Branch R1

Highest Impact Active Events
Last update: 14:00, Jan.11, 2000

Top 10 Problems	Location	Affected Clients
DNS query failure	192.6.3.72	18

View: Last Week



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Pervasive,
continued from page 21

Indeed, one IS manager at a large North American insurance company says he didn't even know IBM was in the field. He wouldn't buy into IBM unless the company provided him with something Nokia and 3Com didn't, he says. "And there has to be set rules and standards so the product can interact with your network without worrying about what brand of equipment you are using," says the manager, who requested anonymity.

Integrated services and products

That is exactly what IBM hopes to do, and in the process that's how the company will differentiate its offerings. IBM provides a variety of integrated product and consulting services its competitors don't. As an example of its service offerings, IBM recently set up an Internet portal for mobile telecommunications company VodaFone AirTouch. The portal delivers content to personal digital assistants (PDA) and mobile phones.

> ***"And there has to be set rules so and standards so the product can interact with your network without worrying about what brand of equipment you are using."***
>
> IS manager,
> North American insurance company

IBM also offers a variety of individual products, such as its handheld ThinkPads. The company's DB2 Everywhere and MQSeries Everywhere software allow these devices to access databases and communicate with network applications.

IBM's Mobile Connect software ensures that the network and handheld device are synchronized. IBM also offers its Transcoding software that will shrink 'Net data so it fits in a PDA or smart phone. To manage mobile users, IBM also sells Tivoli software tools that let IS staff assign and appropriate application resources.

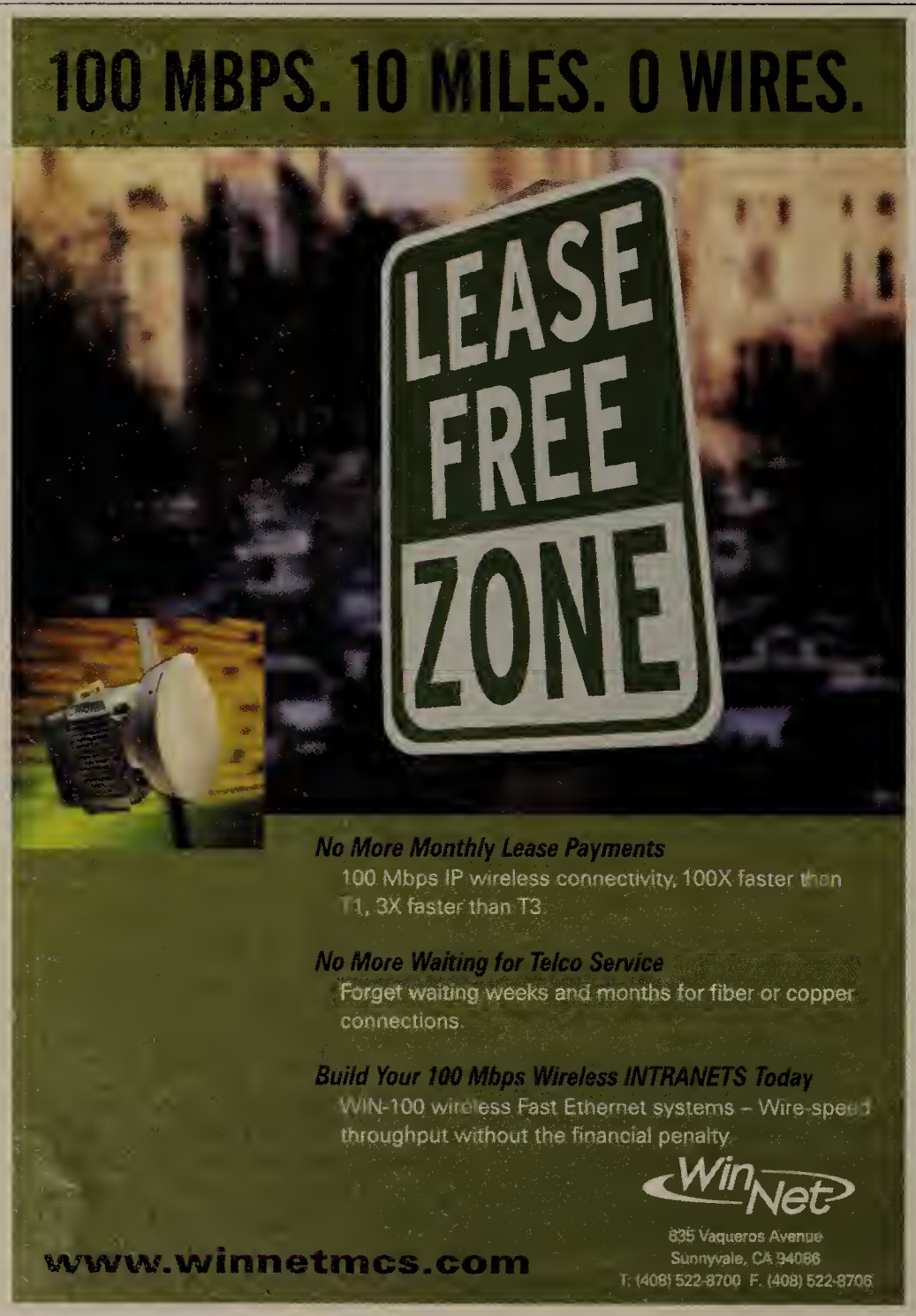
Partnerships may help

The company also has partnerships with companies such as Motorola and Nokia. For instance, IBM bundles Nokia's Wireless Access Protocol (WAP) server software on its line of Windows NT Netfinity boxes. WAP defines a set of protocols that permit Web data to be downloaded onto mobile phones.

With these offerings, IBM's primary role will be to act as an arms supplier for the entire mobile-handheld industry, says Jon Prial, director of marketing for the company's 300-member Pervasive Computing Division, part of the IBM software group. The unit works closely with the IBM Global Services division, which offers extensive consulting packages, and the IBM Research Division, which is actively developing technologies for wireless and handheld device-based networks.

And working behind the scenes, the company also sits on the standards bodies defining pervasive communications protocols, such as XML, WAP and Bluetooth, the specification defining short-range radio frequencies, Prial says. ◩

www.nwfusion.com
THE POWER OF PERVASIVE COMPUTING?
Overview: What is pervasive computing?
White paper: The application framework for e-business.
DocFinder 6725
find it online



Kerberos,
continued from page 21

Windows clients to authenticate to Windows servers.

In addition, ActiveTrust will support a number of clients, including Windows 95 and 98, that cannot otherwise use Kerberos in Win 2000.

The software also has a password synchronization feature administrators can use to create a single sign-on.

While Microsoft and CyberSafe are preaching interoperability, the pair have yet to announce a formal partnership.

Others tackle the problem

But they are not the only companies attacking the issue. Gradient Technologies plans to build interoperability extensions between its NetCrusader DCE Security Server and Win 2000 later this year.

Gradient is likely to focus on solving authorization interoperability in addition to authentication because its authorization mechanism within Kerberos is different from Microsoft's.

Gradient would not provide details, but said it would make an announcement a few months after Win 2000 ships Feb. 17, according to Rick Irving, director of the secure server group.

"There is some work to be done in order to allow users to log in to DCE and get access to Microsoft resources," he says.

Gradient and Microsoft use an authorization extension in the Kerberos standard, called the Auth Data field, in a way that is not interoperable.

Gradient, however, uses a publicly available data format in the Auth Data field and Microsoft does not. Last week, Microsoft again said it is finalizing efforts to publish its format. Once the format is public, other vendors can use it to support authorization to Microsoft resources.

Some work completed

However, Microsoft has finalized work on CyberSafe. The two used CyberSafe's ActiveTrust software to create trust relationships between Unix and Win 2000 Kerberos for financial firm Morgan Stanley Dean Witter.

While Dean Witter officials acknowledge they are able to authenticate users between their Unix and Win 2000 environments, enterprise customers are still likely to find interoperability a challenge.

"Wall Street-type companies have done this sort of interoperability but typically under controlled conditions," says John Pescatore, an analyst with Gartner Group. "What may look easy to Dean Witter may not look so easy to others, especially smaller companies."

Enterprise customers are likely to get more interoperability help once Win 2000 ships. Microsoft is rumored to be testing interoperability with others, including Dascom, which was recently bought by IBM, and the Massachusetts Institute of Technology, which developed the Kerberos Version 5 specification. ◪

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Internetworking Monitor . Kevin Tolly

WINDOWS 2000 SHAPES UP AS NETWORK MONSTER

The wags that said the impact of Year 2000 would not be felt until some time after Jan. 1, 2000 may have been right. For network managers, the most significant event of this year may be 2000-related after all. Plumbing the depths of Windows 2000, to be formally introduced next week, will likely keep net managers busy for most of the year.

Win 2000 is the most significant revamp ever made to the Microsoft Windows operating system — and rumored to be one of the largest software projects of all time. The undertaking lasted three years and cost Microsoft more than $1 billion to develop. While no cost breakdown is available, it is apparent from the sheer volume of enhancements that a significant portion of the effort went into communications and network functions.

What was changed? As a good friend of mine likes to say: "only everything." Developers had a field day piling on features, integrating functions introduced at the service-pack level in previous Win32 releases and tweaking the glorious NT registry.

Net managers had better be prepared for some "different" network behavior when they bring up Win 2000 clients and servers. Nowhere have I seen a Microsoft document that addresses this issue. My guess is Microsoft believes Win 2000 is so much better that nobody is really concerned about the specifics. I am — especially when the changes are so dramatic.

No longer, for example, will a failed default gateway ruin your day. TCP/IP 2000 implements dead-gateway detection and recovery that will redirect your IP traffic to a backup gateway. What is the impact on applications? Microsoft is mum on the topic.

Win 2000 does a lot more than just extend TCP. Support for the lowly network adapter is improved dramatically. With the implementation of the Network Driver Interface Specification 5.0 standard, Win 2000 will offer power management, plug-and-play and — most interesting for Gigabit Ethernet users — task offload. This feature allows the processor on capable network interface cards (NIC) to handle TCP checksum calculation and IP Security tasks that would otherwise burden the PC's CPU. How much will they help, and which NICs support this function? Net professionals need to know.

Win 2000 implements quality of service (QoS) with a vengeance. 802.1p/Q, Resource Reservation Protocol, Differentiated-Services, Signaling, policy-based QoS — there's not a QoS acronym in existence that hasn't found its way into this release. QoS is inherently complex. Facing a choice between different ways of implementing QoS makes things more difficult.

And when you have the strength to go on, you can begin to consider all the changes to IP Multicast, virtual private networking and IP telephony that Microsoft has cooked up for you.

With such massive change, network professionals are well-advised to have a well-thought-out Win 2000 strategy.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at ktolly@tolly.com or www.tolly.com.

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THE CHALLENGE OF 2000:

eBusiness

So we're well into the year 2000 and most businesses have emerged unscathed from the Y2K bug threat. Now the real work begins, that of reinventing the business and orienting it toward commerce at the speed of light over the Internet.

For companies that maneuver quickly and intelligently toward emerging eBusiness models, the opportunities presented by the world of eBusiness are boundless, and so are the challenges. The fact is, the Internet economy is the new era of business: It's global, it's competitive, it's changing the way we all do business, and it's happening quickly!

First there was the Industrial Age. Now business is transforming into the eBusiness Age. And one of the core tools for conducting eBusiness is Web hosting.

Further, the digital economy is changing the rules of competition. While it is important to envision a clever business model for the Internet, it is mission-critical to execute in order to excel—to excel, you must execute. Your eBusiness model must be available, reliable, scalable, and secure. When considering eBusiness, companies must ask themselves how their customers and suppliers would react in the event that their Web site crashes or is slow to respond. To them, it matters not whether you host your own site or if it is outsourced. If you fail to deliver, your company is to blame. So if you choose to have your site hosted by a third party, that company and the service agreement with it must be as reliable and bulletproof as the Web services you want to deliver.

"Using a Web hosting service is much more economical for us and lets us stay focused on our core competencies."
—David Rondan, executive director of operations, MGM.com

"Clearly, a good business model without flawless technical execution is like an Italian sports car without an engine," observes Tammy Cancela, Vice President Sprint Business. "It won't run."

For more and more companies, engaging a Web Hosting Provider is the answer to obtaining sophisticated and scalable Web sites that are continuously available and that won't fail. The outsourced arrangement allows a business to focus on its core competency, while eliminating undue strain on internal IT resources.

WHO IS YOUR SITE'S BEST HOST?

From a technical point of view, designing and operating a functional, competitive eCommerce site is a daunting challenge. The technical challenges are compounded…think about it:

- How will you serve the online communities whose numbers are growing exponentially? And what if millions of those "eyeballs" hit your site simultaneously?
- How will you prevent hackers from defacing your site?
- How will you find time to write and maintain fresh and creative content?
- How do you plan to maintain the whole network—system, hardware, and operating systems—24 hours a day, 7 days a week?

"If you're doing mission-critical electronic commerce, you want to make sure that your customers have a near-perfect experience," says Jeanne Schaaf, senior analyst for public networks, Forrester Research, Cambridge, Mass. "And that depends on a lot of things—including site design, server configuration, technical support, network connectivity, and security."

In addition, there are some business issues associated with Web deployment:

Staffing. Attracting and retaining competent, experienced technical staff continues to be a major problem for Information Age enterprises. Web site expertise is even harder to acquire, since the technologies involved are so new. Also, the set of disciplines required to keep sites up and running effectively is broader than conventional IT skill sets, since Web architecture and management cut across systems, networking, and software technologies. Scarcity of human resources can therefore be one of the primary constraining factors in any company's eCommerce effort.

Budget. Sure, it would be a no-brainer to build the most feature-rich, super-scalable site in your industry—if you had an unlimited budget. But in the real world, resources cost money and money is in finite supply. Business managers therefore need an execution strategy that allows them to get maximum leverage out of every dollar they spend. They also typically need to avoid large capital investments when there's an effective, pay-as-you-go alternative.

Time to Market. In today's fast-moving marketplace, speed is a critical competitive requirement. If your customers beat you to the Internet by erecting almost-perfect Web sites, while your firm took extra time to put up a perfect site, you'll likely have an uphill struggle trying to get their existing customers to defect. Not only is it important to get your sites up and going on the Web quickly, it is critical that your site performs. Recent studies have shown that you have eight seconds to engage your customer online or they are "one click away" from viewing the next Web site—which just might be your fiercest competitor.

Constant Change. Upgrades, new versions, migrations—technology seems to change daily, and keeping up with those changes presents a continual management challenge. Nothing is certain about the near- and long-term future of eCommerce, except for the fact that it will be very different from the present. Technologies, services, and agreements are still in their formative stages. Business managers therefore need to adopt strategies that optimize their ability to respond to changing conditions of eBusiness, such as the outsourcing of their Web hosting and Web site design services

FOCUS ON WHAT YOU DO BEST

Your customer needs are changing, competition is increasing, and resources are stretched. Therefore, industry-leading companies must focus on their core competencies to remain competitive. Technology can give companies that competitive edge. But the care and feeding of the technology monster is not typically part of their core. Therefore, many companies turn to an expert to help them maintain, install, and upgrade their technologies.

Maintenance alone is an incredibly expensive task to perform. A sizable staff with significant expertise would be required in order manage all of the related maintenance and repair issues.

CONTINUED ON PAGE 4 ➣

SPRINT: *Sprint's superior technology, complete solutions, and dedicated customer service make it the #1 eBusiness enabler.*

Web Hosting

FOR COMPANIES THAT DEMAND FLAWLESS EXECUTION OF THEIR EBUSINESS strategies, Sprint delivers performance. Sprint's top-rated Internet backbone, combined with a redundant architecture, enables Sprint Web Hosting to offer its industry-leading 100% site availability guarantee. The guarantee provides customers credits anytime their site is not available. Availability can have a major impact on site revenues, customer satisfaction, and long-term competitive superiority.

Sprint Web Hosting also offers customers of any size the ability to rapidly scale their eCommerce deployments to a capacity previously only available to the largest global corporations. This bandwidth and server capacity allows small- to mid-sized companies to compete with their much larger competitors.

Further, in an alliance with Deloitte Consulting, Sprint Web Hosting offers customers turnkey solutions backed up by access to industry experts in Web technology—in areas including legacy systems integration, server-side Java development, XML-compliant business applications, and Web-based EDI (electronic data interchange). Together, Sprint and Deloitte Consulting help companies capitalize on the business-to-business opportunities now emerging in virtually every vertical market space. Specifically, for example, Sprint Web Hosting enables eCommerce with its rapidly deployable "shopping cart" and transaction processing solutions based on components from several other industry-leading companies.

Supplement Sponsored by Sprint

PORTFOLIO OF SOLUTIONS

Sprint not only offers the technology to enable eBusiness, but also maintains a portfolio of best-in-class creative Web site design sources. To ensure quality, Sprint hand-selects its creative providers based on strict criteria, such as their experience in basic to advanced business-to-business and business-to-consumer eCommerce Web site design, customer service support policies and record, geographic focus, positive references, etc. In short, Sprint provides the best design services available to its customers and concurrently saves customers time, money, and risk in their eBusiness endeavors.

This unswerving focus on customer solutions—which includes an easy-to-use content updating process—makes Sprint the hands down choice for any company that is seeking a true enabler for e-success. Sprint's commitment to complete, reliable, scalable, innovative solutions with superior customer service, makes it the ideal provider of eBusiness solutions.

"One of the clever features Sprint offers is the ability to automatically roll-back your site content if you hit a glitch. That's a good example of how Sprint is always looking for ways to innovate."

—Jeanne Schaaf, senior analyst for public networks, Forrester Research

Sprint is innovative, too. With its customers and end users in mind, Sprint's design engineers continually improve their products and services. "One of the clever features Sprint offers is the ability to automatically roll-back your site content if you hit a glitch," notes Forrester's Schaaf. "That's a good example of how Sprint is always looking for ways to innovate."

It's not just about arriving at the Internet party.

It's about having a great host.

There's never been a better time to join the Internet party. Try Sprint Web Hosting and see for yourself how flexible hosting solutions can help your business. From companies just looking to migrate to the Web, to companies making the Internet a core business strategy, Sprint Web Hosting can free you and your technical support staff from time-consuming server maintenance and costly upgrades. As a result, you're able to concentrate on more mission-critical assignments, like growth, increased global reach, building stronger relationships with your customers, and arriving at the Internet party in style. And isn't that the point of contact? For more information, call **1-888-378-5566** or visit our web site at www.sprint.com/webhosting

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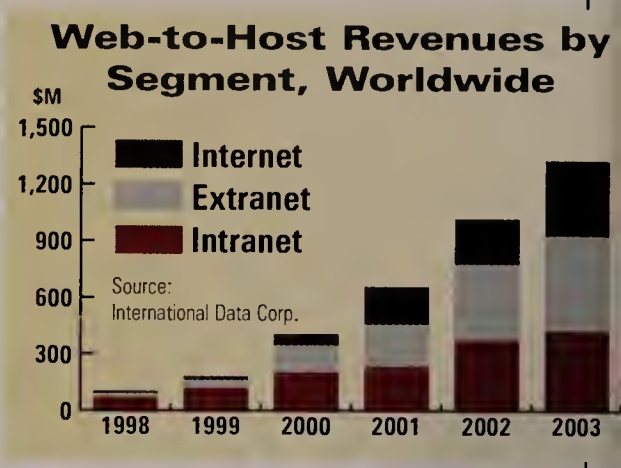
CONTINUED FROM PAGE 2



Instead of focusing on business strategies, companies' IT departments would be bogged down trying to keep up with all of the minor and major maintenance and repair issues. These efforts would cost firms directly in the form of human and capital resource expenditures, and could very well impact them indirectly in the form of the erosion of brand equity or simply inadequate service delivery. For example, a firm may not be keeping up as closely as it should with the latest eCommerce software releases or fixes, while the competitors, who outsource these services, are. This could lead to slow or antiquated online transaction processes that end up dissatisfying customers.

"With collocation, you're sending your technicians in and out of your co-lo space all the time," Schaaf observes. "Why do that when you can have your service provider's technical experts take care of your boxes for you—while you focus on what you do best?"

A Web hosting service is more than collocation of equipment—although collocation itself can provide a business with the ready access to the 'Net bandwidth and secure data center floor space that are vital to 24x7 Web operations. But there is much more to eBusiness than bandwidth and floor space, and that is why a business would want its service provider to offer a complete range of eBusiness services:

- Expert business process evaluation and site/application design
- 24x7 infrastructure monitoring and management
- A full portfolio of "off-the-shelf" eCommerce solutions
- Comprehensive, world-class security services
- Experience in successful application integration
- Customer/market response tracking and reporting
- Creative Web site design services

Web Hosting Providers deliver a broad range of complex services that they must specialize in to ensure that businesses have a robust platform from which to compete in the emerging eBusiness economy. It is likely that because Web Hosting Providers specialize in these services, they will outperform those that do not.

"We're not a technology company," explains David Rondan, executive director of operations for MGM.com, MGM Studios' Web site. "Using a Web hosting service is much more economical for us and lets us stay focused on our core competencies." That kind of straightforward business logic underscores why there is a tremendous growth in demand for Web hosting services. IDC projects the Web hosting market to soar from about $1.5 billion in 1999 to nearly $12 billion by 2002.

Even if a company does not require the full range of services offered by Web Hosting Providers today, they are still well advised to outsource to a company that can provide them all, enabling the addition of services without changing Web Hosting Providers. In other words, keep in mind scalability and reliability.

"By going with a full-service provider who can do everything under one roof, I get a single point of accountability," declares Rondan. "My objective isn't to give myself more things to manage; it's to make my life easier." Forrester's Schaaf sees more and more companies turning to managed services, as opposed to simple collocation.

"In the old days, if your systems began to choke, nobody knew it except your employees," cautions Sprint's Cancela. "Today, the whole world knows. And if you can't scale, success will bring you more problems than profits." ■

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Briefs

Primary Network Communications, a competitive local exchange carrier based in St. Louis, plans to roll out voice over digital subscriber line later this year. The service will initially include only long-distance at 4 to 5 cents per minute, but local phone service will be rolled in later. Primary is basing the service on Accelerated Networks' integrated access devices. Primary also supplies Internet access and data services.

Primary: www.primarynetwork.com

GlobalCenter, a Web-hosting service provider, announced last week it has built a third data center in Sunnyvale, Calif., and is finishing up another in Anaheim, Calif., that's slated to come online by the end of this quarter. A Global Crossings company, GlobalCenter will have a total of eight data centers when its Anaheim facility debuts, including those in Herndon, Va., Manhattan, London and Melbourne, Australia.

GlobalCenter: www.globalcenter.com

Interland, a Web- and application-hosting service provider in Atlanta, recently received a cash injection from Microsoft. The software giant agreed to invest $5 million in the up-and-coming service provider, with an additional $7.5 million pledged to Interland if the company goes public. Interland offers dedicated Web-hosting services and groupware, e-mail and conferencing application rental services, all based on Windows NT server. Microsoft's investment is the third it has made in an application service provider in recent months. Microsoft has invested $50 million in Digex and $10 million in Corio.

Interland: www.interland.net

AT&T to make the Web a faster place

BY DENISE PAPPALARDO

AT&T continues to bolster its Web-hosting capabilities, with the latest boost coming in the form of content distribution services that help businesses increase Web site performance.

AT&T has teamed with a variety of caching and server load-balancing vendors such as Inktomi, InfoLibria and Novell to create its Intelligent Content Distribution (ICD) offering. The service lets businesses copy specific content from their Web servers onto cache servers distributed throughout AT&T's data centers.

"For large companies and those with a strong media focus, content delivery is very important," says Courtney Munroe, program director of Web-hosting services at International Data Corp. in Framingham, Mass. Content distribution services such as those that AT&T, Digex, Adero and Akamai offer let users reduce the number of hops a potential customer has to take to reach a Web site, he explains.

Today, AT&T has data centers running in Manhattan, Middletown, Va., Redwood City, Calif., Mesa, Ariz., and San Diego. The company plans to have 13 data centers running by year-end and 26 operational by the end of next year, says Sandy Brown, vice president and general manager of hosting and value-added services.

Although this is AT&T's first content distribution offering, the service provider is expecting to announce further developments soon. Michael Jenner, vice president and general manager of global IP network services at AT&T, says deals with Akamai, Adero and Digital Island are in progress. It's not exactly clear what type of relationship AT&T would be forging with these three content distribution service providers, especially because all three are potential competitors. Munroe speculates that the service providers may be forming partnerships in which each could share data center space.

In addition to launching ICD and beefing up its data centers, AT&T also announced Ecosystem for application service providers (ASP) and its Enterprise Storage services last month. AT&T's ASP offering is actually a hosting service for potential ASPs as opposed to application rental services for business users. AT&T's Enterprise Storage service is designed for business users and other service providers. The storage service, which will be available in select data centers, lets customers add an EMC storage system to their Web server-hosting environments for added redundancy and content storage.

AT&T's ICD service is available starting at $12,000 per month for up to 10M bit/sec worth of traffic. ◪

Services for a faster Web site

AT&T's Intelligent Content Distribution services let business users bring Web site content closer to users to speed download times and page views. AT&T's offering includes:

- Support in all five of its data centers.
- In the next two years, the service will be available in 26 of AT&T's data centers.
- Multivendor equipment from Novell, InfoLibria and Inktomi.
- On-demand caching and load balancing for events.
- 24-hour support.

www.nwfusion.com

AT&T IN ASP

Overview: AT&T's Ecosystem for ASPs.

Newsletters: Digging into intelligent content distribution.

DocFinder 6724

find it online

BellSouth, allies to offer IP services

BY TIM GREENE

ATLANTA — BellSouth is teaming with two other service providers to prepare large customers for selling on the Web and for setting up Internet-based communications among business partners.

Internet Security Systems (ISS) and Predictive Systems will sell services in conjunction with BellSouth to create and protect e-business networks.

ISS will focus on firewalls, intrusion detection and virus scanning, while Predictive will offer network consulting.

The partnerships allow BellSouth to offer services the company might not be able to otherwise, says Jilani Zeribi, an analyst with Current Analysis, a network consultancy in Sterling, Va.

"The only way you can develop these skill sets is through partnerships," Zeribi says. "To think you can grow your own expertise is foolish and naive."

ISS and Predictive will give BellSouth customers confidence in the services because both have established lines of business with major corporate customers, as well as international reach, he says.

The BellSouth-Predictive alliance offers four services: network readiness assessment; performance management; design and planning; and network management. Based in New York, Predictive has 500 employees and offices in Europe.

Its services are designed for customers with 500 to 10,000 employees. Pricing for these services is based on the extent of the project, but BellSouth will give an estimate at the outset.

BellSouth and ISS are getting together to handle Web security for corporations that don't want to develop the expertise it takes to shield their networks from hackers.

The company offers managed firewalls, intrusion detection and antivirus checks. People skilled enough to handle these tasks are hard to find and hard to retain, so outsourcing makes sense, ISS says.

"Plus BellSouth gains immediate credibility in security, and that's something you just can't buy," Zeribi says.

BellSouth's relationship with Predictive includes a $10 million investment in the company, amounting to a stake of less than 2%. ◪

Mayan to streamline optical networks

BY TIM GREENE

SUNNYVALE, CALIF. — Mayan Networks wants to take the complexity out of optical networks. Specifically, the company wants to remove digital cross-connects, frame relay switches, ATM switches and SONET add-drop multiplexers from service provider metropolitan-area networks.

The result will be less expensive carrier infrastructure and cheaper services to customers, Mayan claims.

Mayan would replace that gear with Unifier, an optical access switch. The switch would sit on a metropolitan SONET ring and act as an add-drop multiplexer, putting traffic on the ring and taking it off via a SONET port. Other ports on the box support ATM, frame relay, time-division multiplexing and IP.

To amass the multiprotocol expertise it needs, Mayan has filled out its roster with employees from 3Com, Lucent, Verilink, Paradyne and SyOptics. The company also has opened development facilities in Phoenix for ATM work and in Richardson, Texas for optical.

Metropolitan SONET rings today are anchored by add-drop multiplexers that are fed traffic by routers or switches. The muxes have been optimized for voice. Unifier takes on the function of the switches and routers and is more efficient about putting data on the fiber, the company says.

Unifier aggregates traffic bound for the fiber ring and crams more traffic into the SONET format than is done with an add-drop multiplexer, Mayan claims. Because the equipment can break down the SONET OC-12 bandwidth into 1.5M bit/sec channels, it can fill up the bandwidth available on the ring more efficiently than a traditional SONET mux, according to Daniel Gatti, Mayan's president and CEO.

The cost of setting up a service provider point of presence with Unifier is $212,000, vs. the cost of multiple single-function equipment, which Mayan says is $556,000.

Unifier can switch any port to any port, and the protocol each port handles is software-defined. So a T-1 hardware card can be programmed to support ATM, frame relay or time division multiplexing. Because of this flexibility, the switch does not necessarily have to sit on a SONET ring.

It can, for example, reside in an office park, attached to a carrier network by an OC-3 trunk. A service provider could use it to distribute lower-speed services, such as frame relay, voice or ATM, to customers in the park, Gatti says.

Replacing multiple boxes with one unifier would give carriers a single platform run by a single management system, and simplify monitoring, maintenance and provisioning, he says.

Unifier is going into beta testing now, and should be available by midyear.

Mayan: www.mayannetworks.com

PROFILE: MAYAN NETWORKS

Headquarters:	Sunnyvale, Calif.
Founded:	1998
Product:	Unifier, an optical edge switch.
Employees:	95
Funding:	$88 million from NEV, USVP, Brentwood, Oak, Amerindo, Doll and Technology Crossover Ventures.
Competitors:	Lucent, Fujitsu, Nortel Networks, ADC Telecommunications.
Fun fact:	Mayan has nothing to do with Central American culture. It stands for Metropolitan Area Access Network. The Y symbolizes a junction of optical and electrical networks.

Eye on the carriers . David Rohde

AT&T, ASP PARTNERS GO ONCE AROUND THE TRACK

I confess I'm not much of an auto racing fan. But I saw enough of ABC's "Wide World of Sports" growing up to recognize Richard Petty's car when I see it — the big No. 43 smothered in corporate logos.

So my ears perked up when Cisco executive Eugene Lee mentioned "Richard Petty syndrome" at a ComNet 2000 press conference organized by AT&T.

AT&T called the event to announce its "Ecosystem" for the application service provider (ASP) business. Cisco was one of an amazing 17 partners assembled by AT&T for the project.

Several of the biggest players were on stage with AT&T data chief Kathleen Earley, and the panelists — including representatives from IBM, EMC, Sun and Novell — were busy generalizing about how wonderful it was for them to be working together. So Lee sensibly took the microphone and tried to bring up a substantive point,"in an effort to avoid making this sound like Richard Petty syndrome."

It was one of those embarrassing moments in which somebody reveals what's going on in the guise of trying to deny it.

AT&T says it's not going to be an ASP selling application services directly to enterprises. Instead, it's going to create an environment — er, an Ecosystem — at an eventual 26 hosting centers where ASPs can pick and choose everything from server farms and storage to messaging and e-commerce applications, and then roll everything into high-performance user applications available for rent.

That's fine, but AT&T is historically lousy at partnerships. So it was natural for someone to ask how AT&T intended to choose among the various operating systems represented by the partners for its hosting centers.

No one wanted to talk about this. The EMC executive repeated his earlier speech congratulating Earley and AT&T for assembling this fine group. Earley herself mentioned, as an example of how companies compete and cooperate, IBM's move last fall to incorporate Linux into its offerings. That set the IBM executive off on a pointless jag about Linux, which has nothing to do with AT&T's ASP initiative.

Now look at the picture this creates. First the user decides to outsource applications. Then it picks an ASP, but it turns out the ASP is a shell that gets its services from AT&T. But it turns out that AT&T is just a transport and gets its hosting infrastructure and services from others. And then it's not even clear what platforms those services are running on.

Does that sound like one-stop shopping to you? One of the points of being a professional enterprise network manager is to manage vendor relationships. Why outsource if it just means your vendor has to manage its relationships?

There's an uneasy chain of responsibility developing in the ASP arena, making users wonder whether what's being offered is any better than what they do today. Richard Petty's stock car may have been slathered with sponsor names, but in the end the race was his responsibility. Can the new application providers say the same?

Rohde is a senior editor with Network World. *He can be reached at drohde@nww.com.*

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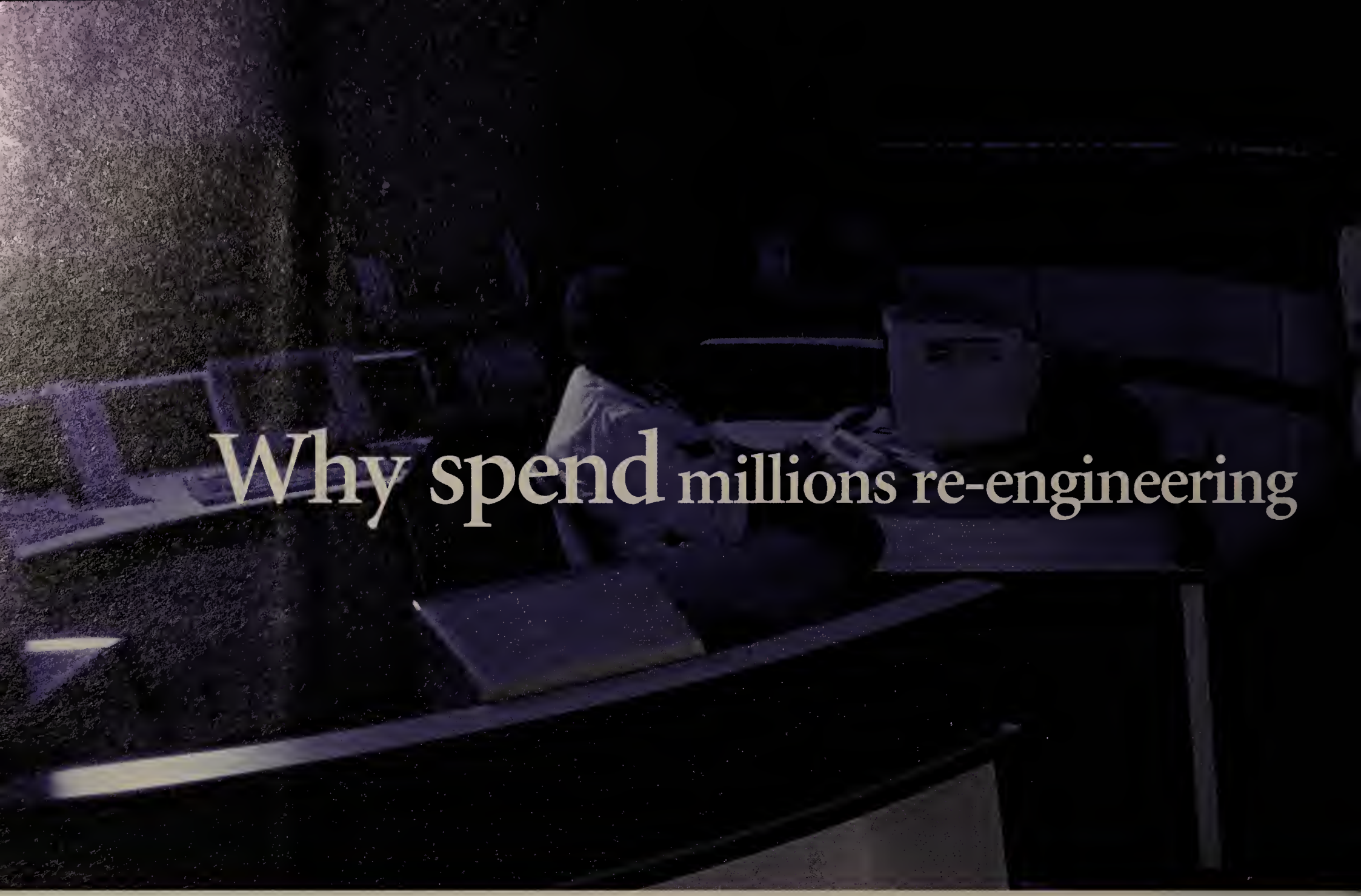

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Charge into telecom isn't easy for utilities

BY DAVID ROHDE

Visit the Federal Communications Commission's Web site, and you'll find more than 100 electric utilities that have applied for — and received — government authorization to become telecom carriers since 1996.

Sound good? Well, don't terminate your long-distance or local carrier contract just yet. First you have to find an electric utility whose telecom business actually includes enterprise-level voice and data services with top-notch customer support.

That's not easy. Ever since Congress let utilities into the telecom business with the Telecommunications Act of 1996, those utilities have been more eager to use their ample broadband facilities to attack the wholesale "carrier's carrier" market or sell consumer telephony and Internet access than to compete for business customers.

But joint ventures and alliances are emerging that hold the promise of finally bringing utilities into the nationwide market for enterprise services, just as the traditional long-distance carriers are consolidating and the Bell companies are branching out from local access.

The utilities certainly have reason to diversify. Selling electricity is a low-growth, highly regulated business. It generates tremendous cash flow, but that has a down side: Utilities' stock prices are highly sensitive to interest rates, and investors knock down utility stocks whenever rates go up. Perhaps worst of all, just a few years behind telecom, the utility business is being opened up to competition, and alternative suppliers are breaking into local utilities' monopolies.

"They're looking to their core business and saying it's a tough business," says Brad Bradshaw, senior director at the Yankee Group's Energy Communications practice. "So they look around to the assets in their business that they can leverage to make some more money."

That extra revenue source isn't always telecom, Bradshaw notes. Some electric utilities are taking their billing systems and repackaging them for other service providers, such as water companies. Others are leveraging their data-center infrastructures and going into IT outsourcing.

Another business opportunity is pole attachments. Many utilities are happy to simply rent space on their poles to other service providers who covet it, especially wireless carriers, says Elliot Hamilton, senior vice president of the Strategis Group, a Washington, D.C. telecom consulting firm.

In a report last year, the Yankee Group identified five pioneers in the field of converting an energy business into a telecom business. But the best known among them — fast-growing Williams Communications and Enron Communications — are carrier's carriers.

The third, Touch America — a subsidiary of Montana Power with operations in 23 states — is a competitive local exchange carrier as well as a carrier's carrier, but it has yet to enter the ranks of top CLECs. The fourth, Entergy Corp., at one point had investments in retail CLECs such as Hyperion Telecommunications, but recently sold them all to refocus on the power-generation business. The fifth, Citizens Communications, has been active in retail telecom but is best known as an incumbent local carrier in smaller cities, though it does own a majority share in Electric Lightwave, a CLEC in the western U.S.

That brings up a central paradox of the utility-based telecom movement: The less ambitious it is, the more interesting it may be to corporate network managers. "An energy company that is more local will tend to have more interest in a retail play," Bradshaw says.

In fact, you might want to look for a company that does a lot of the same things you do. "Most of the utilities have quite extensive telecom networks just for their internal use," Hamilton says. The Yankee Group calls leveraging these networks "insourcing," but cautions that some utility players may actually get some of their long-haul connections from outsourcing.

For example, there's one combination electric utility and telecom provider called Conectiv in Newark, Del., that sells directly to residential and business customers. It utilizes a combination of its own fiber facilities in northern Delaware and surrounding areas of nearby states, plus Bell Atlantic facilities to create a wider regional network in the mid-Atlantic area.

Another twist is being provided by a venture called Utilicom in Franklin, Mass. It makes investments with local utilities that are converting to residential and business telecom providers. Its first network, a joint venture with Southeast Indiana Gas & Electric, is a local carrier in and around Evansville, Ind., called Sigecom. Sigecom focuses squarely on the end user, offering phone service and cable TV to consumers, dial-up and high-speed Internet access to consumers and businesses, and frame relay and ATM to large companies.

Sigecom has signed up 11,000 customers since last year, according to Dan Hanssel, Utilicom vice president of marketing. It provides voice services directly off its own Nortel Networks DMS 500 switch and also employs Nortel's Accelar switches in its Internet operations. But so far its frame relay service is resold from MCI WorldCom and its ATM option is really a private line with ATM signaling gear that requires users to install their own ATM switches. That will change once Utilicom builds out five more local networks this year with the help of venture funding it just received from Blackstone Capital, Hanssel says. Then it will start installing its own frame/ATM switches in its various markets.

The situation is different for firms that aren't looking for public network services, but dark fiber they can light with their own switches. Then it's all a matter of geography.

For example, two years ago, Virginia Power started a subsidiary called VPS Communications that now runs a high-speed network all the way from Raleigh, N.C., to the Northern Virginia suburbs of Washington, D.C. The network originally consisted of SONET gear supplied by Alcatel, and now VPS is upgrading to Alcatel's dense wavelength-division multiplexing system to put 40 channels on a single fiber pair.

The network has 14 points of presence, but there is no switching in the traditional telecom sense, cautions David Fellowes, director of sales and business development for VPS in Richmond, Va. The POPs are merely access points, and VPS still relies on local carriers -- such as Bell Atlantic, MCI WorldCom's local division, and regional CLEC Adelphia — to provide the "on-ramps," Fellowes says.

And while Fellowes says VPS can turn up a high-speed private line on its network in just 10 days, it faces the same problem as any other type of long-haul carrier -- working with the regional Bell operating companies to get the local access line in place.

Yankee Group's Bradshaw cautions that just because an electric utility is a regulated former monopoly just like an RBOC, that doesn't mean the utility has an easier time than other new carriers working with the RBOC.

"It's all the same," Bradshaw says. "They don't get a break." ◪

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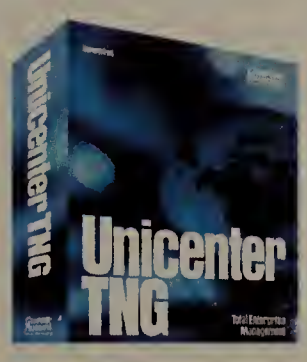

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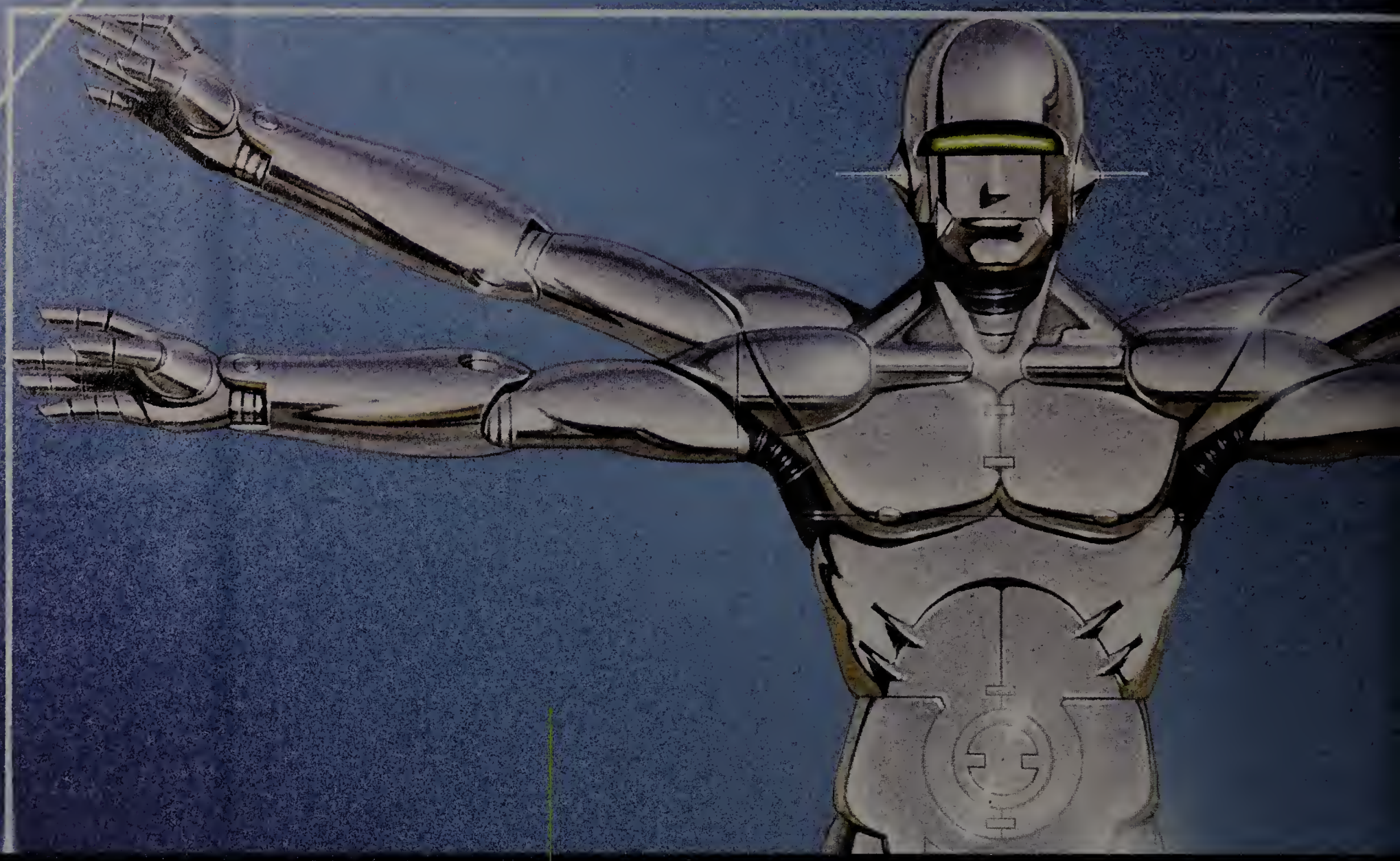

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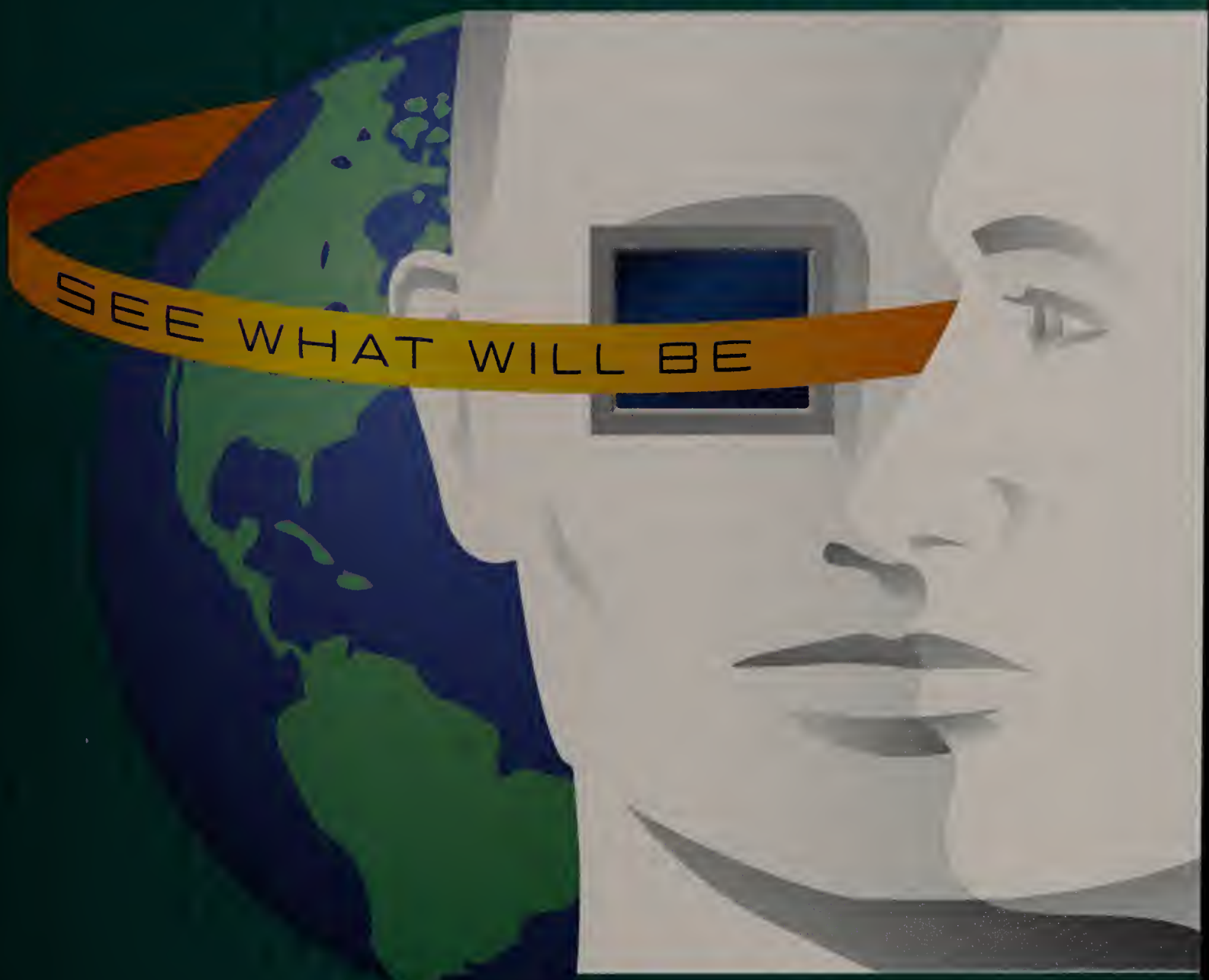

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8:00 am – 9:15 am, Monday, June 5

SUPERCOMM Plenary Panel – CLEC Focus
Royce Holland, Chairman & CEO, Allegiance Telecom

Robert Knowling, President & CEO, Covad Communications

Michael Sternberg, President & CEO, KMC Telecom

8:00 am – 8:45 am, Tuesday, June 6

SUPERCOMM Opening Keynote Address
Keynote: John D. Zeglis, President, AT&T

8:00 am – 9:00 am, Wednesday June 7

SUPERCOMM Plenary Panel, Wireless: Networks for the Future
Chair: Bo Hedfors, Corporate Vice President & President, Network Solutions, Motorola

Panelists: Martin Cooper, Chairman, Co-Founder & CEO, ArrayComm ■ Keith W. Kaczmarek, Senior Vice President, Teligent ■ Nathan M. Kantor, President & COO, WinStar Communications ■ Michael L. Margolis, President & CEO, Tekelec ■ Dennis O'Connell, President, North American Operations, NextLink Communications ■ Larry Schwartz, Group Vice President & GM, Compaq Computers ■ Kari-Pekka Wilska, President, Nokia

5:15 pm – 6:00 pm, Wednesday, June 7

SUPERCOMM Evening Address
Keynote: Edward J. Zander, President & COO, Sun Microsystems

8:00 am – 9:00 am, Thursday, June 8

SUPERCOMM Closing Address
Keynote: Robert W. Lucky, Corporate Vice President, Telcordia Technologies & Chairman, FCC Technical Advisory Committee

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1:00 pm – 2:00 pm, Monday, June 5

GTM/IEC Luncheon Keynote
Keynote: John W. Sidgmore, Vice Chairman, MCI WorldCom & Chairman, UUNET

9:30 am – 11:30 am, Tuesday, June 6

IEC Executive Forum Workshop, "The Communications Industry – Launching the New Millennium"
Moderator: Roger L. Plummer, Managing Director, IEC

Panelists: Rick Burnes, Co-Founder & Principal, Charles River Ventures ■ Tim T. Luke, Vice President, Lehman Brothers ■ Jeffrey A. Schlesinger, Executive Director, Equity Research, Warburg, Dillon, Read ■ William L. Smith, Vice President, BellSouth Telecommunications

12:15 pm – 2:00 pm, Tuesday, June 6

IEC Information Industry Luncheon Presentation
Keynote: F. Duane Ackerman, Chairman & CEO, BellSouth

2:00 pm – 3:30 pm, Tuesday, June 6

IEC Executive Forum Workshop, "The Future of the Internet"
Moderator: Dana Rasmussen, Vice President, Unisphere Solutions

Panelists: Richard E. Caruso, Vice President & GM, IP Network Applications, Nortel Networks ■ Mark Christensen, Vice President & GM, Intel ■ Michael Jenner, Vice President & GM, AT&T Global IP Network Services ■ Lawrence Lang, Vice President, Cisco Systems ■ Milo Medin, CTO, Excite@Home ■ Paul W. Shaneck, Global Marketing Executive, IBM

12:30 pm – 2:00 pm, Wednesday, June 7

IEC Industry Luncheon Presentation
Keynote: Joseph Nacchio, Chairman & CEO, Qwest Communications

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Eastern Research, Inc.
East Penn Manufacturing Co., Inc.
ebm Industries, Inc.
ECI Telecom Inc.
E-Core A Unit of Entrodyne Corporation
EDS
Efficient Networks, Inc.
Eftia OSS Solutions Inc.
EHPT Ericsson Hewlett-Packard Telecomm AB
Eigenlight Corporation
ELDEC CORPORATION
Eldre Corporation
Electric Motion Co., Inc.
Electrodata, Inc.
Elgin/Warren Power Systems
EMKA, Inc.
Enea OSE Systems
Enghouse Systems
Ennovate Networks, Inc.
Ensemble Communications Inc.
Entela, Inc.
Ericsson Inc.
ESRI, Inc.
ETA Circuit Breakers
ETC (Electronic Tele-Communications, Inc.)
E-Tech Research, Inc.
E-TEK Dynamics, Inc.
Evolving Systems
EXELTECH
EXFO E.O. Engineering
Extreme Networks
Farmers Union Insurance
FCI/Malico
FIAMM Technologies, Inc. Energy Division
Fiber-Conn Assemblies Inc.
Fiberoptic Product News
Fibrebond Resources, Inc.
FITEL Technologies, Inc.
FlowPoint Corporation
Fluke Corporation
FORTEC, Inc.
Foxcom
Fujitsu Network Communications, Inc.
Fulcrum Technologies
Galileo Technology, Inc.
Garrett Communications, Inc.
Generac Power Systems, Inc.
General DataComm
Gensym Corporation
GIGANET Ltd.
GI Plastek
GLA International, Inc.
GL Communications Inc.
Glenayre, Inc.
Global Atmospherics, Inc.
Global Communications-Hanson Cooke
GNB Technologies
GN Nettest
GNP Computers
gnubi communications, Inc.
GoDigital Telecommunications Inc.
Granite Systems, Inc.
Graybar
GS Battery (USA), Inc.
GS Industries of Bassett, Inc.
GTS-Gallery Telecom Solutions, Ltd.
HarmonyCom
Harris Corporation
Harris & Jeffries
Hartwell Commercial Products
Hawker Energy Products Inc.
HC Power, Inc.
Hekimian Laboratories, Inc.
HeliOss Communications
HellermannTyton
Hendry
Henkels & McCoy Inc.
Hewlett-Packard Company
HighWave Optical Technologies
Hirose Electric U.S.A.
Hitachi Telecom (USA), Inc.
Home Wireless Networks, Inc.
Hughes Network Systems
Hybricon Corporation
Hybrid Networks, Inc.
Hypercom Network Systems
I-Bus, Inc. (A Maxwell Technologies Company)
ICBS Inter-Commercial Business Systems
ICC - Premise Wiring
ICG Communications
ICOM Technologies
ICO Services Inc.
ICS Advent (formerly Industrial Computer Source)
IDEAL INDUSTRIES, INC.
IEEE Communications Society IEEE Press
ILLUMINET
ILOG
iMagicTV
Independent Technologies, Inc.
InDesign, LLC
Indus Corporation
Indus International
Industrial Technology, Inc.
INET, Inc.
Infineon Technologies Corporation
Infinitec Communications
Info Avenue Internet Services
Information Handling Services Global Engineering Documents
Informix Software, Inc.
Infrared Communication Systems Inc.
Inlogic Software Inc.
InnoMediaLogic, Inc.
Innovative Systems
Institute for Wireless Education
Integral Access, Inc.
Integrated Network Corporation
Integrated Network Services
Integrated Systems, Inc.
Integrix, Inc.
Inter@ctive Week
Intergraph Corporation
International Fiberoptic Technologies
Interspeed, Inc.
Intertech
Intertek Testing Services
IONA Technologies
ioWave
IPCELL Technologies, Inc.
ISR Global
IT Enclosures, Inc.
Itronix Corporation
Ixia Communications
JDS Uniphase
Jetstream Communications, Inc.
Katolight Corporation

Kenetec, Inc.
Keptel, Inc.
Kestrel Solutions, Inc.
Kingston TLI
KMC Telecom
Knaack Manufacturing Co., Weather Guard
Knurr USA Inc.
Kohler Power Systems
Kullman Industries, Inc.
La Marche Mfg. Company
LAMBDA Electronics Inc.
Lancast, Inc.
LAN-hopper Systems, Inc.
Lara Technology
Larscom Incorporated
Larus Corporation
Level One Communications, Inc.
LEXCOM Telecommunications Company
Liebert Corporation
Lightwave-Penwell
Litton Winchester Electronics
Lockheed Martin Global Telecommunication
Loop Telecom International
Lucas Controls, Inc.
Lucent Technologies
Lucent Technologies, Excel Switching
Lucent Technologies Microelectronics Group
Luminous Networks, Inc.
Lumos Technologies, Inc.
Luxcom, Inc.
LuxN
Lynx Real-Time Systems, Inc.
Magellan Network Systems
Malibu Networks
Mantiss Information Corp.
MAPCOM Systems, Inc.
MapInfo Corporation
Marconi
Mariner Networks
Masterack, Div. Leggett & Platt, Inc.
Maxtech Co., Ltd.
MCI WorldCom
Mediation Technology Corporation
MegaSys Computer Technologies
Melard Technologies
Merlot Communications
Metalink
MetaSolv Software, Inc.
MET Laboratories, Inc.
Metro Tel Corp.
MGE UPS Systems
MicroLegend Telecom Inc.
Microsoft Corporation
Microwave dB
MIL 3, Inc.
Miller Freeman Inc.
Minacom International
Mitel Public Switching
Mitsubishi Electric Corporation
Molex Fiber Optics/Molex
Motorola, Inc.
M PHASE Technologies, Inc.
MRV Communications
Multilink Technology Corporation
MULTITEL Inc.
National Technical Systems (NTS)
National Telephone Cooperative Association
NCC Services Inc.
NCR Corporation
NEC America, Inc.
NEC Eluminant Technologies, Inc.
Net Connection Corporation
NetCore Systems, Inc.
Net Insight, Inc.
Netro Corporation
NeTrue Communications
Net to Net Technologies
Network Equipment Technologies
New Access Communication
Newbridge Networks
New Era of Networks, Inc. (NEON)
Newton Instrument Co., Inc.
Nextel Communications
Next Level Communications
NexTone Communications
NGK-Locke, Inc.
Nokia
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Nortel Networks
Noyes Fiber Systems
Nuera Communications, Inc.
Oasys Telecom, Inc.
Objective Systems Integrators
OKI Network Technologies
Omron Electronics, Inc.
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Rycom Instruments, Inc.
Sage Instruments, Inc.
SALIX Technologies, Inc.
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SBE Inc.
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SierraCom
Sigma Systems Group
Silicomp S.p.A
SilkRoad, Inc.
Sirocco Systems, Inc.
SL Corporation
Smallworld Systems
Softalia
SoftPlus, Inc.
SolutionCentral
Somera Communications
SONET Interoperability Forum (SIF)
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Sonus Networks, Inc.
Southwest Research Institute
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Spike Technologies, Inc.
Spring Tide Networks
Sprint North Supply
Step 9 Software Corporation
The Strategis Group
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Sun Microsystems
Sunrise Telecom, Inc.
Surf Communication Solutions Ltd.
Suttle
Switch & Data Facilities Co.
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Sylantro Systems
Symmetricom
Synchronous Group, Inc.
Syndesis Limited
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Taqua Systems
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Terawave Communications Inc.
Tessco
TestMart
Texas Instruments
Tiara Networks
Times Microwave Systems
Tivoli Systems
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Tollgrade Communications, Inc.
Tracewell Systems
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Transtector Systems, Inc.
TranSwitch Corporation
Trillium Digital Systems, Inc.
Tripp Lite Manufacturing
Triton Network Systems, Inc.
Trompeter Electronics, Inc.
TRW
TsDesign Inc.
TTC
TTI - Team Telecom International
Turnstone Systems, Inc.
Tut Systems
UH Communications ApS
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Unipower Telecom Systems
Uniqcom Co., LTD
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University of Denver
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US Conec Ltd.
VAC Corp.
The Vantive Corporation
VDSL Systems
Verilink Corporation
VERTEL
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ViaGate Technologies
ViewGate Networks
VINA Technologies
Virata Corporation
VIR Linear Switch
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Visual Networks
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Xpeed, Inc.
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Zarak Systems Corporation
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A Guide To SUPERCOMM's Conference Programs

SUPERCOMM's 240+ education sessions offer an opportunity to take advantage of critical and collective learning that is essential in the fast-changing communications industry. Our comprehensive educational curriculum encompasses free keynotes, plenary panels, and industry updates open to all registrants as well as fee-based conference programs, provided by SUPERCOMM's education and programming affiliates.

SUPERCOMM INDUSTRY UPDATE SESSIONS

Monday, June 5

SUPERCOMM's Industry Update Sessions provide you with the insight and technological expertise you need to prepare for the future. Topics include the following:

- **Enterprise Networking**
- 3G Technologies
- ATM
- Broadband Networking
- Cable TV
- Frame Relay
- IP Telephony
- Optical Networking
- OSS
- Wireless Data
- XDSL

New Enterprise Solutions Monday, June 5, 10:00 am – 11:30 am

A new generation of packet and IP-based applications is migrating toward the enterprise market. Services such as collaborative videoconferencing, high-speed data, Web-enabled capabilities, intranets and others will place new demands on existing business networks and service providers. What are the emerging services and what will be their demand? Join this panel of industry experts as they discuss these issues and others surrounding emerging next-generation enterprise communications.

Chairperson & Speaker: Paul Wallner, President, Hypercom Network Systems

Speakers: Tim Fritzley, President & CEO, CEON

Adam Lorant, Co-Founder & Vice President, Abatis Systems

Kumar Shah, Vice President, AccessLAN Communications

Computer Telephony Advances Monday, June 5, 1:00 pm – 2:30 pm

Advances in computing and communications technologies have created a new and competitive marketplace where the lines between processing and the interconnection of users have become blurred or nonexistent. Explore how vendors and service providers are taking advantage of a variety of new capabilities in a cost-effective single network.

Chairperson: Gary Beach, President, CIO Magazine

Speakers: Stewart Hampton, Senior Manager, Comverse Network Systems

Andrew Lee, Director, Service Assurance, Objective Systems Integrators

Jeff Paine, Vice President, Magellan Network Systems

Frame Relay and ATM Directions Monday, June 5, 3:00 pm – 4:30 pm

How do these technologies cooperate and compete? In this session, we provide four different perspectives on trends in frame relay and ATM technology and deployment. Sizing, deployment, usage and trends for growth of frame relay are discussed, as well as the key technical differentiators of these technologies. The evolution of these roles is illustrated here, as well as the impact these technologies have on vendors that manufacture equipment that access or build backbone networks.

Chairperson: Lori Dreher, Product Line Manager, Lucent Technologies

Speakers: Jeffrey Davis, Director of Product Management, Paradyne

If you opt to supplement the free program by participating in any of the fee-based programming, please register for each conference separately. To receive a comprehensive schedule and course description of paid educational conferences, indicate your interest on the enclosed registration form or contact the conference organizers directly.

GLOBAL TELECOM MARKET (GTM) FORUM AT SUPERCOMM

Global Opportunities – Path to Market

Sunday, June 4 – Monday, June 5

The Global Telecom Market (GTM) Forum at SUPERCOMM offers a series of 14 special Workshops, coupled with Plenary and Keynote presentations focusing on global telecommunications technologies, markets and related business issues.

Segmented into three tracks, these Workshops provide you with keen insight for expanding your business into new and emerging global markets, technologies and business issues:

- Global Regional Markets & Opportunities
- Internet/E-Commerce
- Technology Evolution

Special GTM Enterprise Programming Monday, June 5

- Global VPN Services
- E-Business #1: Business-to-Business Opportunities
- E-Business #2: Business-to-Customer
- Security & Encryption

For more information on costs for this program, or to register, visit www.supercomm2000.com, or call +1-312-559-4120

INTERNATIONAL COMMUNICATIONS ASSOCIATION (ICA) – *Conference 2000 Program*

Sunday, June 4 – Wednesday, June 7

Long recognized for excellence in program content development, the ICA Conference 2000 Program will help enterprise professionals including corporate, government and various institutional leaders examine new ground in technology, strategy and industry policies and regulations. Each session is designed to meet user needs with introductory, intermediate and advanced levels of content.

The ICA Conference 2000 Program focuses on the most important trends in business since the Internet: e-business and e-commerce.

This conference will not only describe the technology required to implement e-web, but also present management tools and techniques that assure resilient, cost-effective implementation. Examples of success and failure will provide the benefit of real-world experience.

Among the Conference Sessions dealing with enterprise issues are:

Sunday, June 4

- The Last Mile
- Program/Project Management
- Managing Multinational Communications
- Serving the Internal Client
- Network Aware Web Design

- Web-Based Customer Service
- Securing the Enterprise Network
- Managing Sourcing Strategies
- Assessing New Technology for the Enterprise

Monday, June 5

- Broadband Backbone Technologies
- Framework for EC, with International Case Studies
- CTI – Beyond the PBX
- Intranets & Extranets: Planning Design & Implementation
- Managing the Technical Professional
- Browser to Back-End Basics
- Competitive Advantage from Technology
- Designing Scalable Network Applications
- Transitioning Legacy to Net Centric
- Contingency Planning & Reliability

Tuesday, June 6

- Broadband ATM
- Access Alternatives
- E-Commerce Case Studies
- Exchange Shoot-Out
- Convergence/Industry Consolidation
- Advanced VPNs
- Voice Over X
- E-Clearance & Cash Contact
- Taking Your Net Global
- International Telecom Policy

Wednesday, June 7

- Broadband ISDN, DSL, FR
- Directory Services
- Internet II
- Voice as a Killer Application
- Mergers & Acquisition Survivors
- Network Modeling & Capacity Planning
- Barely in Beta
- Threats to E-Commerce
- Future PBX
- View from Wall Street & Sandhill Road
- Attitude to Security
- Broadband Optical (Carrier Side)
- Building Real IP Telephony
- Technology Convergence
- Open Mike Forum
- Network Management: Self-Service

For more information on costs for this program, or to register, visit www.icanet.com, or call +1-214-902-3632

The ICA is the oldest and most influential trade association of Information Technology professionals dedicated to serving end-users throughout the Americas and the world. The ICA has been a driving force in the industry by effectively presenting the end-user perspective to policy and regulatory authorities to promote constructive competition, reduce costs, introduce new technologies and provide valuable educational, professional development and networking opportunities to its members.

INTERNATIONAL ENGINEERING CONSORTIUM (IEC) – *Communications Forums*

Monday, June 5 – Thursday, June 8

The IEC Communications Forums are designed specifically for information-industry executives and managers. The IEC is known industry-wide for the level-playing-field atmosphere of its events — events that allow industry professionals to meet and discuss the critical issues of the day, driving the industry forward by their collective learning. Customize your educational experience by choosing the Sessions and TecForums that best meet your professional needs.

The Special Forums are:

- Competitive Local Exchange Carrier (CLEC) Forum
- Global Service Provider Forum
- Internet Service Provider Forum
- IP Telephony Forum
- Wireless Forum

Enterprise Networking Sessions Monday, June 5

- IP Telephony Architectures & Next-Generation Networks
- Optical Networking Advances

Tuesday, June 6

- IP Telephony, Fax, Video Services & Apps
- Next-Generation Network Switches
- Fundamentals of Fiber-Optic Technology
- Fundamentals of the Internet
- IP Network Access Technologies
- Electronic Commerce
- Packet Telephony Fundamentals
- Future of the Internet

Wednesday, June 7

- Public Policy Trends
- IP Telephony Deployment Status
- IP Telephony: Strategies & Business Issues
- Quality of Service for Packetized Voice
- Standards for an Emerging Network: Reality Check

Thursday, June 8

- IP Networks & the Future of Global Communications

For more information on costs for this program, or to register, visit www.iec.org, or call +1-312-559-4600

SUPERCOMM SCHEDULE AT-A-GLANCE

	Sunday June 4	Monday June 5	Tuesday June 6	Wednesday June 7	Thursday June 8
Free SUPERCOMM Programs	5:00 pm – 5:45 pm	8:00 am – 9:15 am 10:00 am – 5:00 pm	8:00 am – 8:45 am	8:00 am – 9:00 am 5:15 pm – 6:00 pm	8:00 am – 9:00 am
GTM Forum at SUPERCOMM	2:15 pm – 7:00 pm	9:45 am – 5:15 pm			
ICA – Conference 2000 Program	9:00 am – 5:00 pm	9:00 am – 5:00 pm	1:30 pm – 5:00 pm	9:00 am – 6:45 pm	
IEC – Communications Forums		9:30 am – 5:00 pm	9:00 am – 3:30 pm	9:15 am – 3:30 pm	9:15 am – 5:00 pm
IEC Executive Forum @ SUPERCOMM			9:00 am – 3:30 pm	9:15 am – 3:30 pm	
Exhibition			9:00 am – 6:00 pm	9:00 am – 5:00 pm	9:00 am – 4:00 pm

IEC EXECUTIVE FORUM @ SUPERCOMM

Tailored to the special information needs of senior decision-makers, the IEC Executive Forum @ SUPERCOMM offers an unsurpassed opportunity for executives to network with one another in a noncompetitive, information-sharing environment of high-level insight. The Executive Forum is designed to provide these invaluable insights to senior executives who are striving to compete effectively with winning strategies and vision for success in the emerging telecommunications marketplace.

Program Overview and Schedule

Tuesday, June 6

9:30 am – 11:30 am
IEC Morning Executive Forum Workshop
The Communications Industry – Launching the New Millennium

Moderator: Roger L. Plummer, Managing Director, IEC

Panelists: Rick Burnes, Co-Founder & Principal, Charles River Ventures

Tim T. Luke, Vice President, Lehman Brothers

Jeffrey A. Schlesinger, Executive Director, Equity Research, Warburg, Dillon, Read

William L. Smith, Vice President, BellSouth Telecommunications

12:15 pm – 2:00 pm
IEC Information Industry Luncheon Presentation

Keynote: F. Duane Ackerman, Chairman & CEO, BellSouth

2:00 pm – 3:30 pm
IEC Afternoon Executive Workshop
The Future of the Internet

Moderator: Dana Rasmussen, Vice President, Unisphere Solutions

Panelists: Richard E. Caruso, Vice President & GM, IP Network Applications, Nortel Networks

Mark Christensen, Vice President & GM, Intel

Michael Jenner, Vice President & GM, AT&T Global IP Network Services

Lawrence Lang, Vice President, Cisco Systems

Milo Medin, CTO, Excite@Home

Paul W. Shaneck, Global Marketing Executive, IBM

Wednesday, June 7

12:30 pm – 2:00 pm
IEC Industry Luncheon Presentation

Keynote: Joseph Nacchio, Chairman & CEO, Qwest Communications

Tailor your Wednesday educational experience by choosing three Sessions from among the full Wednesday Session line-up.

For more information on costs for this program, or to register, visit www.iec.org or call +1-312-559-4600.

The International Engineering Consortium (IEC) is a nonprofit organization dedicated to catalyzing positive change in the information industry and its university communities. The IEC provides high-quality educational opportunities for industry professionals, academics and students. In conjunction with the industry, the IEC develops free, online, Web-based tutorials. The IEC conducts industry-university programs that have substantial impact on curricula. It also conducts research and develops publications, conferences and technological exhibits addressing major opportunities and challenges of the information age. More than 70 leading, high-technology universities are currently affiliated with the Consortium. Industry is represented through substantial corporate support and the involvement of many thousands of executives, managers and professionals.

DECISION #84

How do I ensure 100% access to my remote users?

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A. REGISTRANT INFORMATION

Do not use this form if you are working an exhibition booth or are a member of the press.
For exhibitor registration, call +1-301-694-5243. For press registration, call 1-888-873-7277.

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A2 ❑ A copy of my formal invitation letter should be sent to my local US Embassy or Consulate in _____
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Please call +1-703-907-7480 if you require Americans with Disabilities Act services. No one under 18 years of age will be admitted to SUPERCOMM 2000. Attendees must be involved in the communications or information technology industries.

B. PAYMENT METHOD REGISTRATION FEE: By May 4 – FREE After May 4 – $100.00

Register before May 4 to waive the $100 non-refundable registration fee and receive your badge in the mail.

Bill $100 to my ❑ VISA® ❑ MasterCard® ❑ American Express®

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C. COMPLEMENTARY EDUCATION

As a SUPERCOMM registrant, your exhibit pass gives you access to the exhibition on June 6 – 8 as well as free SUPERCOMM keynotes, plenaries, industry update sessions and MWBE program running June 4 – 8. **Please select the free sessions you plan to attend.** Tickets are not required to enter these events.

C1 ❑ **Global Directions Plenary**, Sunday, June 4
C2 ❑ **CLEC Plenary**, Monday, June 5
C3 ❑ **Industry Update Sessions**, Monday, June 5
C4 ❑ **MWBE Program**, Monday, June 5
C5 ❑ **Opening Address**, Tuesday, June 6
C6 ❑ **Wireless Plenary**, Wednesday, June 7
C7 ❑ **Evening Address**, Wednesday, June 7
C8 ❑ **Closing Address**, Thursday, June 8

D. FEE-BASED EDUCATION

Choose to complement your free program by participating in any of the fee-based conferences. To receive more information, please check the conference in which you are interested, contact the organization directly or visit **www.supercomm2000.com** You must register separately for each conference.

D1 ❑ **Global Telecom Market (GTM) Forum at SUPERCOMM** +1-312-559-4120
E-mail: gtm-supercomm2000@iec.org

D2 ❑ **ICA Conference 2000 Program**
+1-214-902-3632
E-mail: information@icanet.com

D3 ❑ **IEC Communications Forums**
+1-312-559-4600
E-mail: iec-supercomm2000@iec.org

D4 ❑ **IEC Executive Forum @ SUPERCOMM**
+1-312-559-4606
E-mail: exec-supercomm2000@iec.org

E. IMPORTANT! Questions 1 – 6 must be answered completely to process your registration and receive your badge in the mail.

Please help us collect correct audience demographics. While we require that you complete the following, if you do not want your name included on the list we provide to our exhibitors, please check the following box: ❑

1. BEST DESCRIPTION OF YOUR COMPANY'S/INDUSTRY'S PRIMARY BUSINESS: (check one only)

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❑ 101 ASP/Web Hosting
❑ 102 Cable TV/Broadcast
❑ 103 Carrier Service Reseller
❑ 104 Carrier's Carrier
❑ 10S CLEC/CAP
❑ 106 Interconnect
❑ 107 International Carrier/PTT
❑ 108 Internet Service Provider
❑ 109 IXC/Fiber Network
❑ 110 LEC/ILEC
❑ 111 LMDS/MMDS/Microwave
❑ 112 Satellite Service Provider
❑ 113 Utility (Non-Telco)
❑ 114 Wireless Carrier (Cellular/PCS)

CORPORATION/INSTITUTION
❑ 11S Education
❑ 116 Executive Recruiter/Search Firm
❑ 117 Financial Institution/Venture Capital Firm
❑ 118 Government/Regulatory/Military
❑ 119 Legal Services
❑ 120 Medical/Health Care
❑ 121 Trade (Retail/Wholesale/Hospitality)
❑ 122 Transportation

TECHNOLOGY
❑ 123 Communications Equipment Manufacturer
❑ 124 Consulting Firm
❑ 12S Contractor
❑ 126 Engineering
❑ 127 Manufacturer (Non-Communications)
❑ 128 Research & Development
❑ 129 Software Developer

SUPPLIER/RESELLER
❑ 130 Dealer/Distributor/Agent
❑ 131 VAR

OTHER
❑ 132 Association
❑ 133 Publishing/Media/Advertising
❑ 199 Other

2. IF YOUR COMPANY IS A SERVICE PROVIDER, PLEASE INDICATE ALL AREAS OF BUSINESS: (check all that apply)
❑ 201 ASP/Web Hosting
❑ 202 Cable TV/Broadcast
❑ 203 Carrier Service Reseller
❑ 204 Carrier's Carrier
❑ 20S CLEC/CAP
❑ 206 Interconnect
❑ 207 International Carrier/PTT
❑ 208 Internet Service Provider
❑ 209 IXC/Fiber Network
❑ 210 LEC/ILEC
❑ 211 LMDS/MMDS/Microwave
❑ 212 Satellite Service Provider
❑ 213 Utility (Non-Telco)
❑ 214 Wireless Carrier (Cellular/PCS)

3. PRIMARY JOB FUNCTION: (check one only)
❑ 301 Accounting/Billing
❑ 302 Consulting
❑ 303 Contracting
❑ 304 Corporate Management
❑ 30S Education/Training
❑ 306 Engineering/Technical
❑ 307 Financial Services/Leasing
❑ 308 Industry Analyst
❑ 309 Internet Services/Web Design & Development
❑ 310 Investment Analyst/Research
❑ 311 Investment Banking/Venture Capital
❑ 312 Legal/Regulatory
❑ 313 MIS/Network Operations/ Network Management
❑ 314 Product Management
❑ 31S Purchaser/Corporate Buyer
❑ 316 Research & Development
❑ 317 Sales/Marketing
❑ 318 Software Development
❑ 319 Telecom Systems Management
❑ 399 Other

4. MY AREA OF INTEREST IS: (check all that apply)
❑ 401 Public Network Products/Services
❑ 402 Enterprise Network Products/Services

5. PRODUCT/TECHNOLOGY/SERVICE INTEREST: (check all that apply)

PRODUCTS/TECHNOLOGIES
❑ S01 Access Solutions
❑ S02 Broadband Networks
❑ S03 Cable & Wire
❑ S04 Components
❑ 50S Computer Telephony
❑ S06 Computing Platforms
❑ S07 Customer Care/Billing
❑ S08 Customer Premises Equipment
❑ S09 Enhanced Services
❑ S10 Intelligent Networks/AIN
❑ S11 Internet/Intranet Systems
❑ S12 IP Telephony/Networks
❑ 513 LMDS/MMDS/Microwave
❑ S14 Multimedia Applications
❑ S1S Network Management
❑ S16 Network Services
❑ S17 Optical Networking/Fiber Optics
❑ S18 Outside Plant Equipment
❑ S19 Power & Energy
❑ S20 Professional/Consulting Services
❑ S21 Satellite Communications
❑ S22 Software
❑ S23 SS7 Products/Applications
❑ 524 Switching & Transmission Systems
❑ S2S Test & Measurement
❑ S26 Video/Visual Communications
❑ S27 Wireless Networks/Infrastructure

SERVICES
❑ S28 Data Services (DSL, ATM, Frame Relay)
❑ S29 International Carrier Services
❑ S30 Internet Access/Hosting
❑ S31 Leased Line/Leased Bandwidth Services
❑ S32 VPN/Intranet
❑ S33 Wireless/Satellite Services
❑ S99 Other

6. YOUR ROLE IN BUYING DECISION: (check one only)
❑ 601 Approve
❑ 602 Recommend
❑ 603 Specify
❑ 604 No Role

TE1

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No one under 18 years of age will be admitted to SUPERCOMM 2000. Attendees must be involved in the communications or information technology industries.

B. ACCOMMODATIONS

ARRIVAL DATE _____

DEPARTURE DATE _____

Provide six hotel choices (Sheraton Atlanta is the ICA Headquarters Hotel and Atlanta Marriott Marquis is the IEC Headquarters Hotel).

1. _____ 4. _____
2. _____ 5. _____
3. _____ 6. _____

Room Type:

❑ Single ❑ Double (2 persons/1 bed) ❑ Double/Double (2 persons/2 beds)

ADDITIONAL OCCUPANT _____

SPECIAL REQUEST _____

AMERICANS WITH DISABILITIES ACT CONSIDERATIONS _____

C. PAYMENT METHOD A deposit is required.

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Hotel reservations should be made through SUPERCOMM Housing & Travel. Hotels cannot fulfill requests for SUPERCOMM blocks. Confirmations are sent by SUPERCOMM, not by hotels.

DOWNTOWN Hotel	Rates Single/Double
1) Atlanta Hilton and Towers*	$195/$215
2) Atlanta Marriott Marquis	176/196
3) Best Western Inn at the Peachtrees	134/144
4) Courtyard by Marriott Downtown	131/141
5) Days Inn Downtown	151/161
6) Embassy Suites Downtown	210/230
7) Fairfield Inn Downtown	104/114
8) Hampton Inn & Suites	124/144
9) Holiday Inn Downtown	154/164
10) Howard Johnson Suites	107/117
11) Hyatt Regency Atlanta	191/206
12) Omni Hotel at CNN Center*	210/230
13) Quality Hotel Downtown	93/103
14) Renaissance Atlanta Hotel	175/195
15) Ritz-Carlton Atlanta*	229/249
16) Sheraton Atlanta	145/160
17) Suite Hotel Underground	155/155
18) Super 8 Downtown	95/95
19) Westin Peachtree Plaza*	190/210
20) Wyndham Hotel Atlanta	154/154

MIDTOWN Hotel	Rates Single/Double
21) Days Inn Peachtree	104/114
22) Fairfield Inn Midtown	94/94
23) Four Seasons	210/210
24) Georgian Terrace	193/193
25) Hampton Inn Midtown	94/104
26) Holiday Inn Express North Ave.	114/114
27) Holiday Inn Midtown North	91/91
28) Regency Suites Hotel	146/166
29) Sheraton Colony Square	163/173
30) Wyndham Garden Midtown	141/151

BUCKHEAD Hotel	Rates Single/Double
31) AmeriSuites Buckhead	145/155
32) Doubletree Hotel Buckhead	120/130
33) Embassy Suites Hotel Buckhead	189/199
34) Grand Hyatt Atlanta Buckhead*	199/219
35) Hampton Inn Buckhead	124/124
36) Hawthorne Suites	141/151
37) Holiday Inn Buckhead	126/136
38) Homewood Suites	150/150
39) JW Marriott at Lenox	198/198
40) Lenox Inn	118/118
41) Ramada Inn & Conference Center	104/114
42) Ritz-Carlton Buckhead	228/228
43) Sheraton Buckhead Hotel Atlanta	172/172
44) Sleep Inn Buckhead	139/139
45) Swissotel	185/205

AIRPORT Hotel	Rates Single/Double
46) Atlanta Airport Hilton & Towers	158/173
47) Atlanta Airport Marriott	136/136
48) Crowne Plaza	155/155
49) Holiday Inn North Airport	110/110
50) Renaissance Atlanta Concourse	134/134
51) Sheraton Gateway	159/169
52) Westin Airport Hotel*	145/145

Cancellations must be made 72 hours before scheduled arrival date, unless noted, for refund of your deposit.
* Indicates cancellation policy differs.

Bus Rebate: $5 per room night for SUPERCOMM Shuttle Service (except Omni and Embassy Suites Downtown) is included in the hotel rates.

MAP OF HOTELS AND TRAVEL INFORMATION

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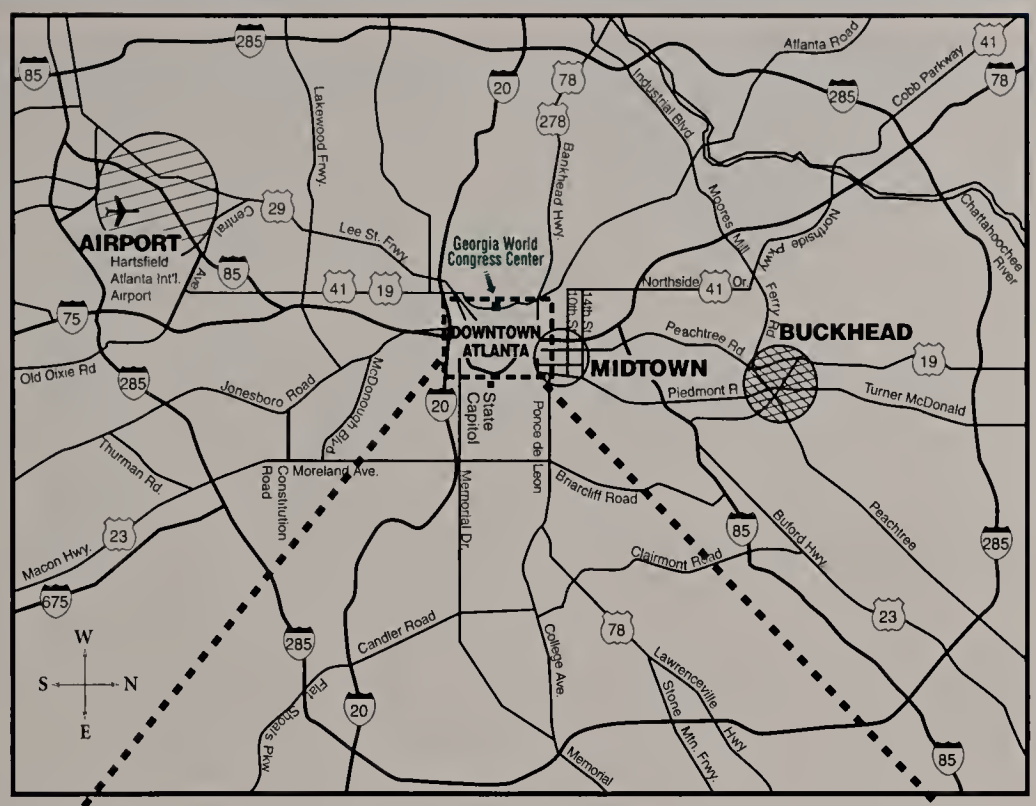
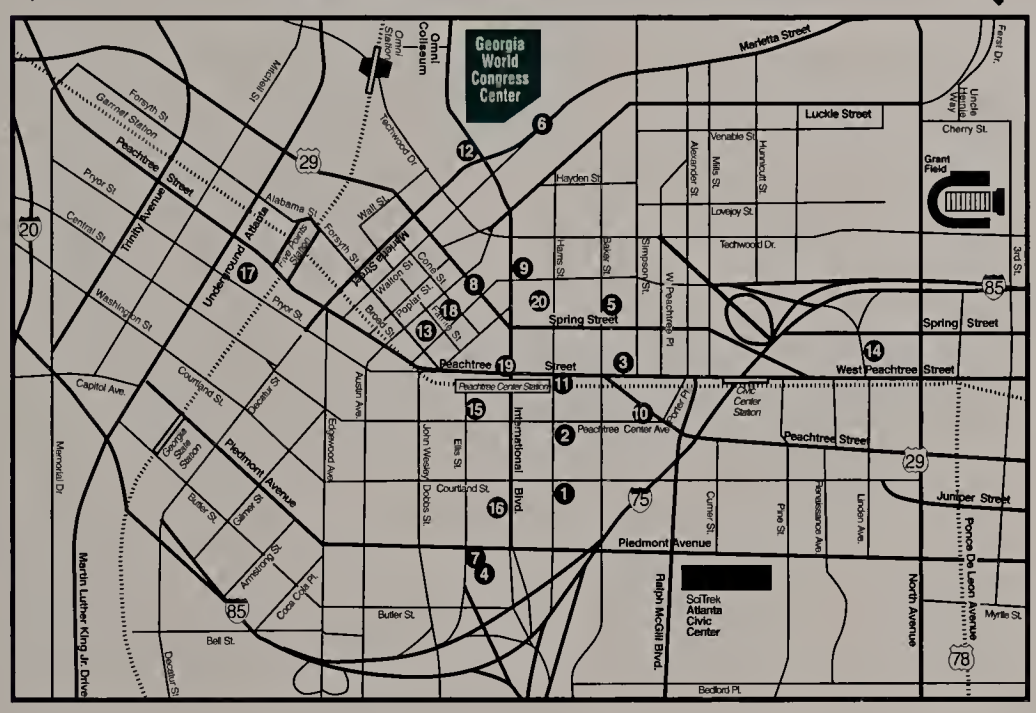


Detail Map of Downtown Atlanta



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What is the best way to set up data conferencing?

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TE1

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Briefs

Microsoft and **VerticalNet** have announced a joint effort aimed at delivering business-to-business e-commerce services to small and midsize companies in vertical markets. Under the agreement, Microsoft will invest $100 million in the Horsham, Pa., company VerticalNet, which operates 55 industry-specific vertical trade Web sites, the companies said in a joint statement. Microsoft will also provide VerticalNet with distribution and marketing support through several of its Internet units, including its small-business portal site, bCentral, and the MSN Internet service network. VerticalNet, in turn, promised to speed up its adoption of Microsoft products and technologies, including upgrading its operating system platform to Windows 2000 Professional Edition.

LabCal Technologies next month is scheduled to ship PKIcomplete, software that lets companies evaluate different types of public-key infrastructure (PKI) products. The offering, which works in conjunction with products such as Microsoft Project, also includes a methodology for rolling out a PKI designed to secure a company's network. PKIcomplete will cost $20,000.

LabCal: www.labcal.com

Commerce One in Walnut Creek, Calif., and **Cephran** in Palo Alto have signed an agreement to build a business-to-business e-commerce portal for use by the building and construction industry based on Commerce One's MarketSite software. The companies say their first step will be setting up online catalogs for use by distributors, manufacturers and specialty contractors. Cephran supplies software services to the building and construction industries.

@Stake's pitch: Hackers are your friends

Start-up employs hackers to offer a wide selection of security services.

BY ELLEN MESSMER

CAMBRIDGE, MASS. — Security start-up @Stake has caused quite a sensation since its recent launch as a professional services firm employing members of the hacker nether world as hired guns sent out to test corporate networks for vulnerabilities.

So far, @Stake has no marquee corporate customers willing to state they have actually hired any of the company's two dozen or so hacker employees to give them advice on how to secure their networks, from selecting firewalls and antivirus software to setting up e-commerce applications.

These employees include Mudge — the leader of the underground group L0pht — and even more amazingly, Dildog, top dog in the notorious Cult of the Dead Cow (CDC).

@Stake says corporate America is bound to buy into the idea that the hacker underground is the best source of independent security consulting you can get.

"We don't have a hidden agenda based on a product," claims Mudge, co-founder of @Stake along with security analyst Ted Julian, who brought in executives from CertCo, Compaq and Cambridge Technology Group as management.

Mudge says he will continue to use the moniker Mudge, even though he is now well above ground with @Stake, funded by Battery Ventures to the tune of $10 million.

Mudge's Boston-based group, L0pht, is famous for developing the password-cracking software Crack as well as AntiSniff, software for detecting someone using a sniffer to spy on your network.

@Stake founders Mudge and Ted Julian

PROFILE: @Stake

Headquarters:	Cambridge, Mass.
Founded:	1999
Product:	Security services aimed at e commerce business.
Founders:	Daniel Geer, CTO; Ted Julian, vice president of marketing; Phil Tams, vice president of consulting; Mudge, vice president of research and development; John Rando, chairman.
Funding:	$10 million in funding from Battery Ventures.
Employees:	24
Fun fact:	Mudge, the company's head of R&D, is the former CEO of hacker think tank L0pht.

Mudge says L0pht — a registered corporation — has made money for years selling its software and providing advice to U.S. government agencies, including the Departments of Justice, Defense and Energy.

L0pht is now being restructured to play the role of a nonprofit company with a scholarship fund.

See **@Stake**, page 46

Security

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Lotus' Iris development group still opening eyes

Lab continues to roll out innovative Domino enhancements and Notes upgrades.

BY JOHN FONTANA

CAMBRIDGE, MASS. — At last month's Lotusphere conference, IBM veteran Al Zollar emphatically stated that his appointment as Lotus CEO would not mark the beginning of the end for the software developer.

Zollar was addressing the concerns of Lotus customers and partners who want to see Lotus continue to operate as a more-or-less independent subsidiary of IBM, rather than get blended into the parent company.

Lotus supporters are all for having the company work closely with IBM and integrate its technology with that of other IBM businesses; they just don't want Lotus — and particularly its Iris Associates development labs — to lose their unique identities.

Iris has been the brains behind Lotus Notes since the product was first released in 1989 (see story, page 46).

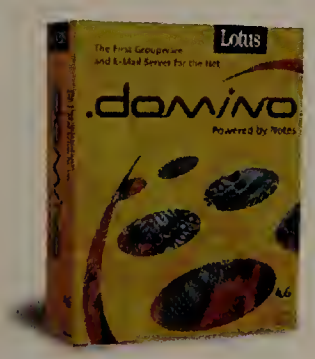
Iris is doing its part to justify Lotus' independence, working on a host of technologies designed to beef up Domino's core strengths. The work is focused on directory, security, replica-

See **Lotus**, page 46

In the works at Iris

The Lotus development group has the following in the works for Domino:

- A general-purpose directory with extensible schema.
- Support for public-key infrastructure for X.509 certificates.
- Better support for XML.
- Improved server clustering technology.



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Sendmail adds admin console, IPv6 support

New Unix-based tool can manage Sendmail-based e-mail systems across a widespread organization.

BY CAROLYN DUFFY MARSAN

EMERYVILLE, CALIF. — Sendmail will announce today Unix-based software designed to help enterprise network customers more easily manage commercial or open source versions of Sendmail's Internet e-mail routing software.

The company also will unveil Version 8.10 of the open source sendmail code, which features support for IPv6, an upgrade to the current version of IP. With this version, Sendmail is the first e-mail application ported to IPv6.

Developed in 1981 by researcher Eric Allman, sendmail is a free software package used on 75% of the world's Internet e-mail servers. Allman formed Sendmail, Inc. in 1998 to provide souped-up versions of the open source sendmail software to commercial customers. Until now, Sendmail offered two commercial packages for e-mail routing and hosting: Sendmail Pro for Unix and Sendmail NT for Windows NT.

The new Sendmail Multi Switch provides a management platform that integrates Sendmail systems dispersed throughout an organization into a unified, centrally controlled system. It offers distributed management of Sendmail message transfer agents, multiuser administration and role-based migration tools, which allow administrators to change the role Sendmail plays in the organization — for example, from an Internet gateway to a Sendmail hub. Other features include testing and management tools, monitoring and reporting systems, and hooks into content management software sold by third parties. Available immediately, Sendmail Multi Switch sells for $4,500.

For smaller organizations that don't need to administer multiple sendmail message transfer agents, Sendmail offers the streamlined Sendmail Multi Switch. This offering includes the same testing and management tools, monitoring and reporting features, and third-party product support as Sendmail Multi Switch. Sendmail Switch sells for $500.

In March, Sendmail will add a secure switch that will provide e-mail session encryption. According to industry observers, The Sendmail Secure Switch is significant because the popular sendmail software has been a target for hackers.

The new Sendmail switches will be attractive to users of commercial and open source versions of sendmail, says Mark Levitt, director of collaborative computing at International Data Corp. in Framingham, Mass. "If you're a company that has multiple Sendmail systems in use, having a single place for administration can save a lot of time and money," he says. "Sendmail is offering upgrades to the open source code at a fairly good price."

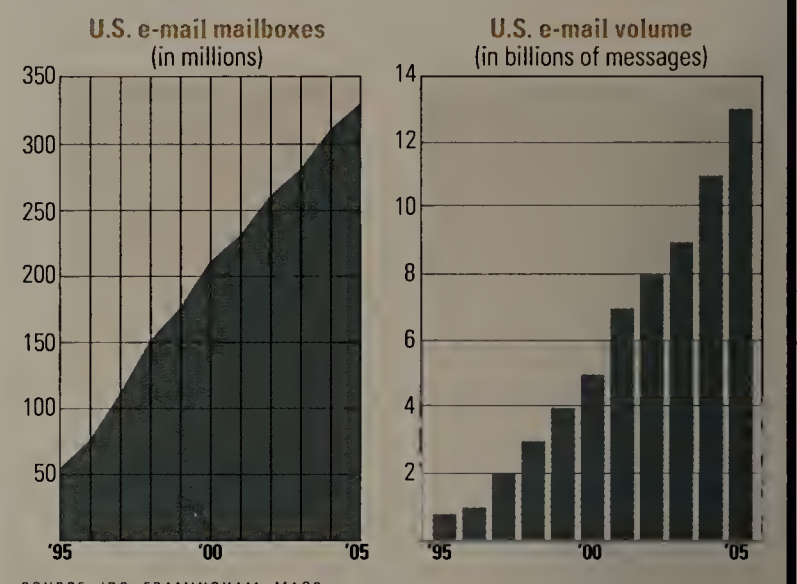
Meanwhile, Sendmail has enhanced the open source code with 130 new features, including IPv6 support. Leaders of the Internet engineering community are pleased about Sendmail's IPv6 support and hope it will encourage end users to migrate to IPv6.

"We need many applications converted and are always happy when it happens," says Bob Fink, co-chair of the Internet Engineering Task Force's IPv6 transition working group and a network development scientist with the Energy Sciences Network at Lawrence Berkeley National Laboratory. "As so much code derives from sendmail, it is probably a bigger deal than most run-of-the-mill applications being converted."

Sendmail: www.sendmail.com

E-mail growth continues

E-mail growth has boomed over the past several years and will continue to grow steadily, analysts say.



SOURCE: IDC, FRAMINGHAM, MASS.

Avesta Technologies snares a series of impressive wins

BY CAROLYN DUFFY MARSAN

It will be easier then ever for federal network managers to buy software for monitoring the performance of Web-based applications, thanks to a deal struck recently between Avesta Technologies and reseller Government Technology Services, Inc. (GTSI).

The pact is the latest in a series of wins for Avesta, a New York maker of software that tracks and manages the quality of Internet services delivered to end users.

Avesta's two product lines — Trinity, which monitors the performance of IT and Internet services in real-time, and eWatcher, which tracks the response times of Web applications — are now available for government users from GTSI, a government contractor based in Chantilly, Va., that also offers Avesta's products on the General Services Administration's Multiple Award Schedule contract, a list of hundreds of prequalified hardware and software products available at discounts to federal buyers.

The federal win comes on the heels of other Avesta victories in government and industry. Four-year-old Avesta boasts such large enterprise customers as Morgan Guaranty Trust Co., Waterhouse Securities and the National Institutes of Health.

"The financial services market was the first to see the value of what we're offering," says Helen Toth, vice president of marketing at Avesta. "They're using our products to improve the availability and performance of the networks behind their critical business systems. They're leveraging our products not only to monitor their networks on a real-time basis, but also to determine what caused a problem."

Big with service providers

Toth says Avesta products also are attractive to network service providers, which use them to track their internal operations and figure out ways to improve their customer service. Avesta's carrier-class customers include ICG Equipment, ALLTEL Information Services, Bell Atlantic and US West.

But the company's newest push is in the government sector. "There's a sense of urgency in the public sector that network managers want to document the performance of their networks against their service-level agreements," Toth says. "They need to maintain higher levels of uptime."

Citing plans to go public later this year, Avesta officials declined to release the dollar value of the latest government win. However, Toth says the deals are "significant for us."

Charlie Jones, a network administrator with the National Institutes of Health, confirmed that the agency is using Avesta's Trinity software but declined to comment further. "As a government employee, I can't endorse any company or product," he says.

Industry observers say Avesta has managed to attract attention among end users and the investment community because of its unique technology and strong customer service.

"For such a small company, Avesta has managed to achieve decent name recognition," says Susan Aldrich, a senior consultant with Patricia Seybold Group in Boston. "They are the sole providers of this technology, which puts them on the A list for investments. . . . And customers find Avesta's products and the people who support them to be of good quality."

Avesta's products run on Windows NT and Solaris platforms, and will soon be available for the IBM S/390.

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Lotus,
continued from page 41

tion, database performance and support for XML.

"Our architecture is flexible and built for the long haul," says Tim Halversen, an Iris co-founder.

Iris also is working with other parts of IBM to integrate Domino into Big Blue's e-business framework, most notably with IBM's WebSphere Web server.

Among Iris' most notable efforts is its work on directory technology. Lotus introduced Domino Directory in Domino R5 last year as a replacement for the original Name and Address Book, but Iris is clearly not stopping there.

"In the future, we intend to have a highly scalable general-purpose directory with extensible schema," says Steve Berkhardt, an Iris co-founder. "What that means is we intend to make the Domino directory scalable enough to be a core enterprise directory."

That goal overlaps with IBM's development of its SecureWay directory as an enterprise-class directory, but it's unclear at this point how tightly Domino Directory and SecureWay will be linked.

Another potential area for collaboration between Lotus and IBM is network security. Berkhardt and Halversen say Iris is working on adding support to Domino for the public-key infrastructure for the X.509 (PKIX) certificates standard, an IETF standard for digital certificates. IBM last year submitted its PKIX reference implementation, called Jonah, to the IETF.

More Domino improvements

Berkhardt and Halversen say their stable of 200 engineers is also working on improving core Domino services, including deepening support for XML so documents can be processed via XML in Notes, and improving performance and scalability of Domino's replication engine and databases.

"We'll provide controls so users can choose which documents get replicated and in what order," Berkhardt says.

As for database innovations, Halversen says Iris is working to improve scalability by making clusters of Domino servers appear as one virtual server. Iris is also working to let Notes databases work better with other databases, such as IBM's DB2. ◩

WHAT IS IRIS?

Iris Associates was formed in 1984 when Ray Ozzie, considered to be the father of Lotus and Lotus Notes, decided it would be best to physically move his development team away from the madness of parent company IBM.

Although Ozzie left Iris in 1997 to build a secretive Internet start-up called Groove Networks, Iris' 200 engineers continue to be the innovators behind Domino.

Among other things, the engineers have developed the Sametime instant messaging server and the Raven knowledge management suite.

— John Fontana

@Stake,
continued from page 41

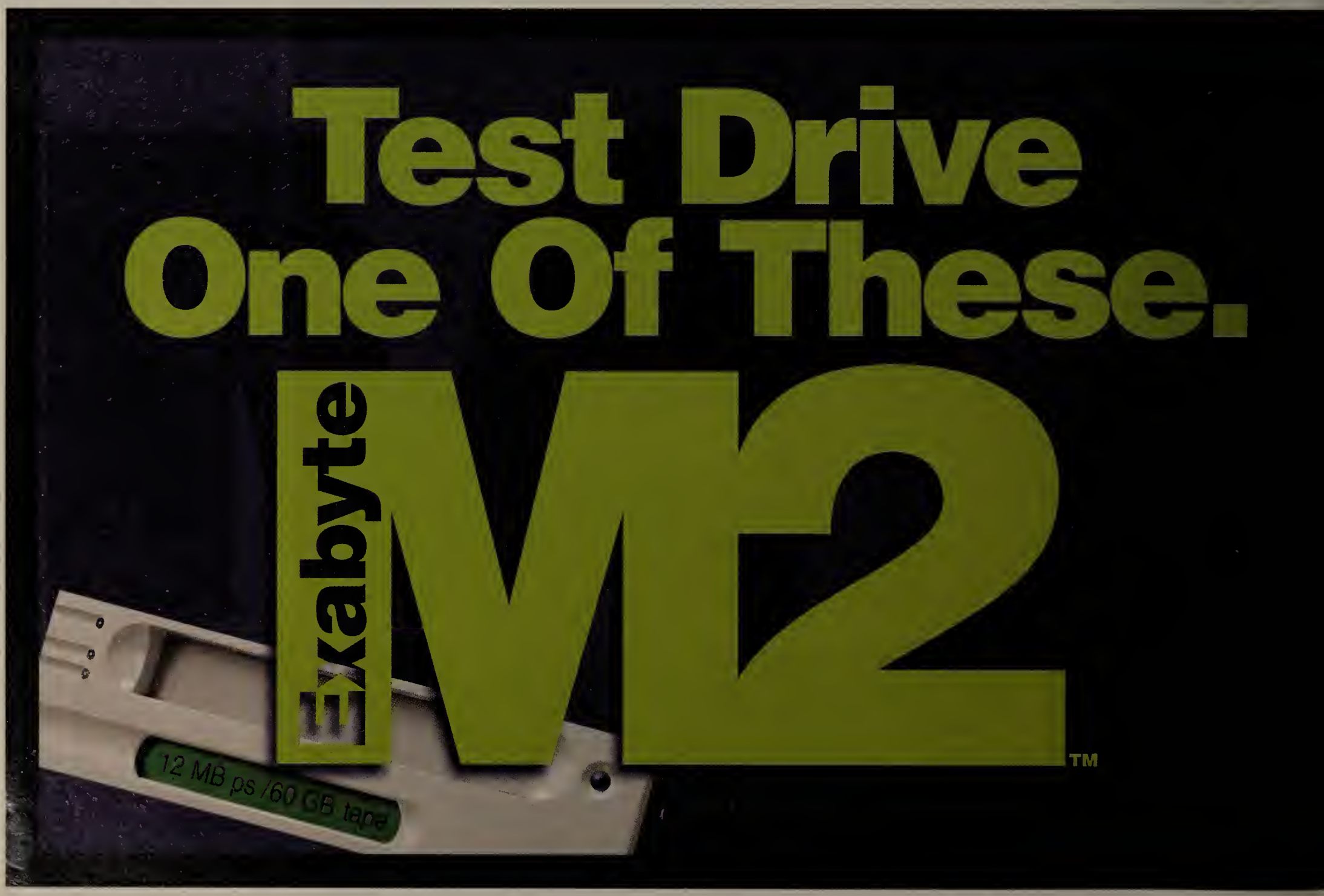
"It'll be more like a charity, maybe for the Cancer Society," Mudge says.

Other underground figures employed by @Stake are going to be a much harder sell than Mudge, who swears he never broke into a corporate network.

Take Dildog, the main author of the Trojan horse program dubbed Back Orifice 2000. Last summer at the Defcon hacker convention, Dildog cavorted onstage with about two dozen CDC members exhorting an audience of thousands to use his creation, Back Orifice, to take over Windows-based networks.

But now, faced with the prospect that he could get rich if @Stake ever goes for an initial public offering, Dildog is ready to renounce his past.

"We didn't advocate breaking into networks," Dildog says. "It was all a joke on the media. And I never broke into a network in my life." ◩



WatchGuard to safeguard DSL, cable modem links

VPN/firewall devices work hand in hand with enterprise net firewalls to protect home offices and small offices.

BY ELLEN MESSMER

SEATTLE — Digital subscriber line (DSL) and cable modem services have been high-speed blessings for telecommuters and workers in small offiees. But there also exists a danger — because these services are always "on," they give hackers a better chanee of probing and breaking into computers, and perhaps even gaining aceess to corporate networks.

To counter this threat to DSL and cable, WatchGuard Teehnologies next month will begin offering a first line of defense in the form of two new network firewalls/enerypting virtual private network (VPN) devices. Firebox Teleeommuter is for home use, and Firebox SOHO is for small offices.

Firebox Teleeommuter, whieh is priced at $650, has four ports that DSL or eable-modem users can plug their computers in to to gain seeure access to the Internet. Family members can surf the Web for fun while the teleeommuter in the house gets an encrypted VPN link to the eompany intranet.

"Firebox Telecommuter allows the spouse or children to go to the Internet, but only you to go to the corporate network," says Vincent Salas, WatchGuard's director of product marketing.

Firebox Telecommuter gives home workers an encrypted VPN link to the company intranet.

The net device "points" toward WatchGuard's Firebox 2, an enterprise network firewall supporting up to 5,000 users. Firebox 2 plays a role in managing the at-home deviee.

WatchGuard's other new DSL/cable modem firewall, Firebox SOHO, is designed for small to midsize business offices. It supports up to 50 cable modem or DSL users. Five of them ean use an encrypted VPN tunnel simultaneously. Prieing starts at $450 for 10 users.

Firebox Telecommuter and Firebox SOHO are managed through the browser-based Firebox management eonsole.

JDA Software in Seottsdale, Ariz., is eurrently beta-testing Firebox Telecommuter. The company has 500 employees involved in designing the code for managing retail sales. Larry Leonhardt, direetor of IT, says his firm already uses Firebox 2 at its corporate site, but JDA Software wants to be sure its employees with high-speed DSL or eable access can securely aeeess the corporate intranet from home.

Leonhardt says he is concerned about hackers, having seen his own home computer scanned by outsiders over a eable modem network. He monitored this aetivity while testing the Deerfield WinGate desktop firewall product, which worked fine. But he says he's leaning toward using Firebox Telecommuter because his IT staff is familiar with the WatchGuard technology and the deviee can be managed remotely.

"I didn't want my IT staff spending an inordinate amount of time having to learn new firewall software in order to deal with home computers," Leonhardt says. "With WatchGuard, it's a plug-and-play device, extremely easy to set up."

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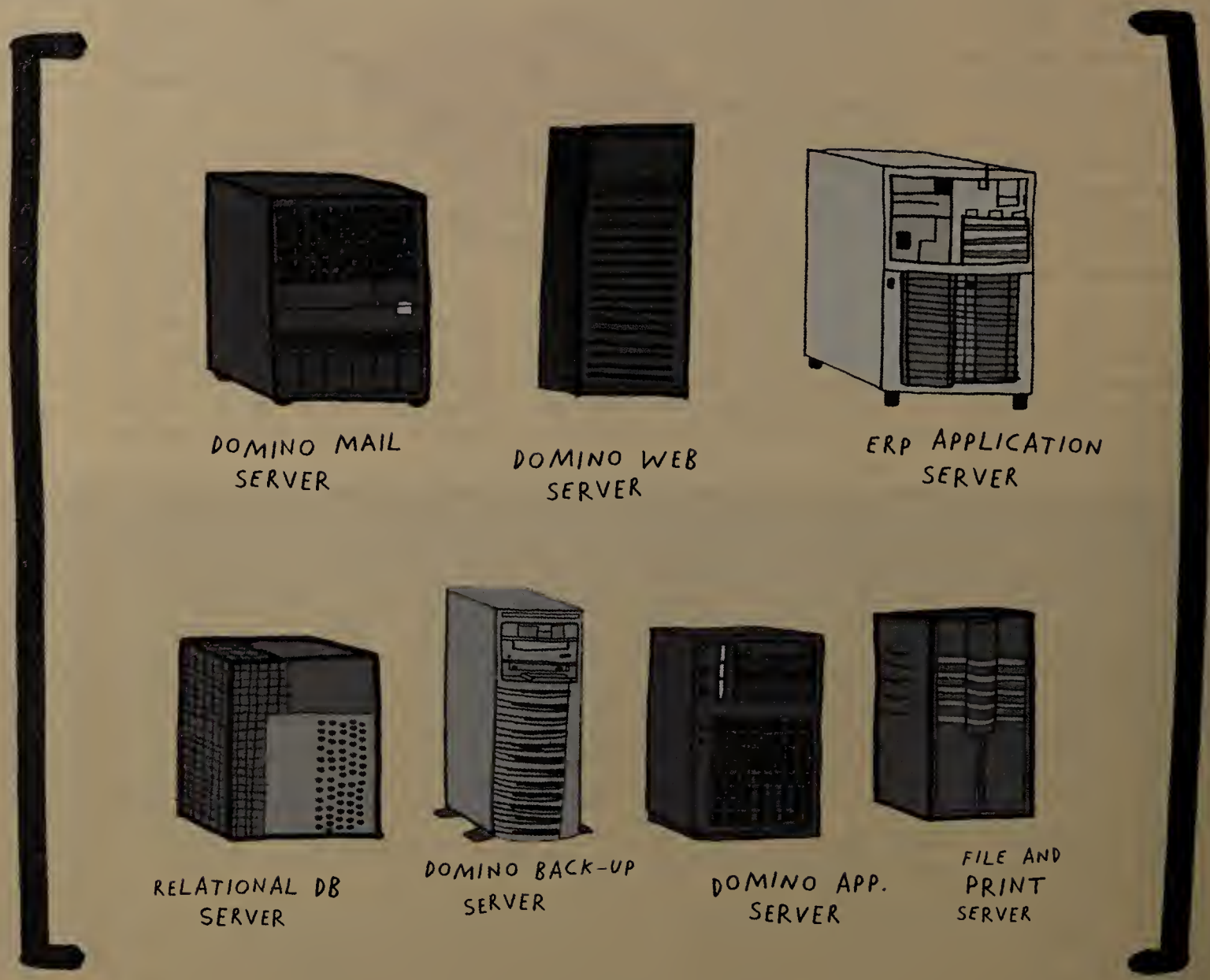

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'Net Insider . Scott Bradner

OF COPIES AND RIGHTS

The field of intellectual property rights has not been made any easier by the advent of the Internet and of a world in which intellectual property (a different kind of IP than what I usually talk about) is increasingly digital in nature.

Intellectual property rules and concepts developed through hundreds of years of experience, with physical objects becoming increasingly out of sync with the possibilities and characteristics of the digital world. It may be time to rethink the rules.

The National Research Council (NRC), part of the National Academies in Washington D.C., assembles groups of people, usually with quite diverse points of view, to study problems deemed important by various parts of the U.S. government and others. The NRC has just published a report called "The Digital Dilemma: Intellectual Property in the Information Age" (ISBN 0-309-06499-6 and on the Web at www.cstb.org) from one of these study committees. I may be just a bit biased, since I was a member of the committee that produced this new report, but I think it's a good document.

The 18-member committee, working over a period of almost two years, looked at every aspect of IP we could think of. We found divergent, passionate, yet reasoned views on just about every aspect of the subject — both from those the committee asked to address us, or to review the draft of the report, and within the committee itself. I cannot hope to summarize the 337-page report in the less than 500 words that I'm allowed in this column, so instead I will focus on three points.

Historically, the IP community's response to new technology has been to try to fit the technology into existing IP paradigms and apply existing rules to the new technologies. Where the existing rules cannot be made to cover the new technologies, the reaction has been to establish new rules, using the old logic, to cover the particular new technology. One of the committee's major conclusions was that there should be no rush to try to create new IP-related laws before we understand the implications of the technology.

Another conclusion was that IP rights holders should not automatically assume the best way to ensure that they get their rightful return from their IP is to install content protection systems, as the DVD community has. The IP rights holders should investigate other options to see if new business models may do as effective a job at a lower cost.

A third point is really more of a question: Is "copy" still the right fundamental concept? Computer and network systems make many temporary copies of data in their normal processes. Might it be a good time to rethink just what it is that constitutes IP rights? For example, the concept could be that the IP rights holder deserves returns when someone views the IP.

Disclaimer: Although Harvard is good at rethinking others' fundamental concepts, the above book report is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

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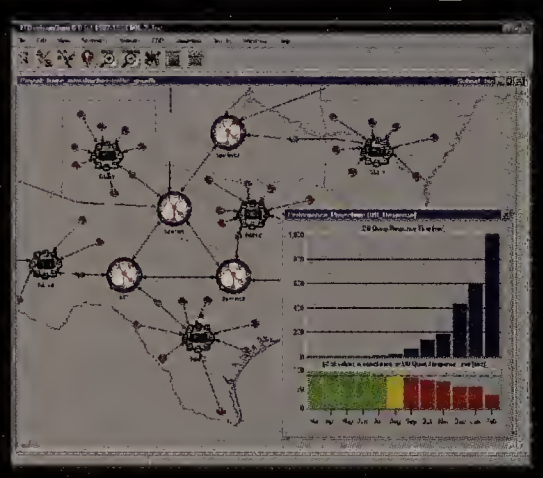

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Ask Dr. Intranet

By Steve Blass

We switched most of our intranet servers to Windows NT 4 and chose TCP/IP as our network protocol. We configured our printers with Hewlett-Packard JetAdmin as LPR devices using TCP/IP as their only protocol. Now when we print more than 10 documents in succession, the print queue stalls for almost five minutes before it prints the next 10 jobs. The stop-and-go printing continues until the queue is cleared. How can we fix our printing problems?

By default, new LPR connections use TCP/IP ports 721 through 731. After a port is used, it sleeps for two to four minutes before being used again. You can watch this by using the command 'netstat' to see how many of the ports are sitting in a time-wait status. Microsoft has a fix for this. By changing the registry to each LPR entry you can specify whether print connections use the default TCP/IP ports or any available port numbered higher than 1024. An article at http://support.microsoft.com/support/kb/articles/Q179/1/56.ASP describes this.

In the registry, find HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\LPDSVC\lpr. The value names list will contain the IP addresses of each configured LPR printer port. The value will be 0 or 1. At 0, the printing service runs in compliance with RFC 1179 and uses IP ports 721 through 731. At 1, the print service uses any available IP port greater than 1024. Change the settings from 0s to 1s and the stuttering should stop.

Blass is a network architect at Sprint Paranet in Houston. You can reach him at dr.intranet@paranet.com.

The benefits of IP multicast over DSL

BY RADU CRAIOVEANU

The combination of IP multicast over DSL lets network managers broadcast news, radio and television feeds, stock updates, and voice or video conferences with exceptional cost and bandwidth efficiency.

The architecture of the underlying protocol is the key to those efficiencies. Traditional systems would have to maintain multiple unicast streaming sessions — one for each user. This requires a lot of bandwidth and does not scale well.

Imagine a building with dozens of tenants, all subscribing to the same videoconference via the same ISP. Without IP multicast, a content server would have to send the same feed to each tenant. With a typical bandwidth requirement of 300K bit/sec for a television feed, multiplying this for each user dramatically illustrates the unicast bandwidth problem.

New local loop broadband technologies, including cable and digital subscriber line, make multicast services possible. Both cable and DSL technologies have the bandwidth to support at least one live videostream. Most routers offer several protocols that enable IP multicast.

There are two components to the IP multicast support. One consists of the communication between the routers in the network, and the other is the last-leg connection between the access router and the client using the service. The result is a network tree, with the server residing at the top, routers forming branches among themselves and leaves in the direction of service users. As new users join, routers form new branches to connect the server and the client. As users go away, the routers prune, deleting those leaves.

In order to implement IP multicast fully, network hosts must be able to support a multicast protocol to enable them to connect to the local router or to the multicast server itself. This protocol, called Internet Gateway Multicast Protocol (IGMP), is a standard piece of the IP stack found on all PCs and most routers. It is mainly a registration protocol where PCs register to join a particular multicast group or service.

In addition to the registration and deregistration component, there is a "keep-alive" component. Routers can connect to each other all the way to the multicast server via interrouter protocols such as Protocol Independent Multicast, Distance Vector Multicast Routing Protocol and Multicast Open Shortest Path First. The multicast server may be either directly connected or routed to the clients, which dictates whether there is a need for inter-router multicast protocols.

If the customer is connected via DSL, there usually will be a Digital Subscriber Line Access Multiplexer (DSLAM) and customer premises equipment (CPE) pair between the point of presence router and each user's PC or each user's access router. The points of interest in that chain are the connection between the POP router and the DSLAM, followed by the connection between the DSLAM and the DSL CPE.

The behavior of the link between the DSL CPE and the user will be physical-network-dependent. In most cases, it will be Ethernet, which has built-in support for multicast. If Ethernet framing and Ethernet bridging are used to go through the DSL infrastructure all the way to the POP router, the POP router will be aware of all the IGMP join requests and will be able to service them by forwarding traffic with a multicast media access control address toward the DSLAM.

The DSLAM may support some aggregation techniques, such as those offered by an Ethernet link between the DSLAM and the router. In that case, the router would only send one packet from each server to the DSLAM. The job of the DSLAM would be to send only that packet to the appropriate DSL port. In order for that to happen, the DSLAM needs to be able to support IP multicast protocols.

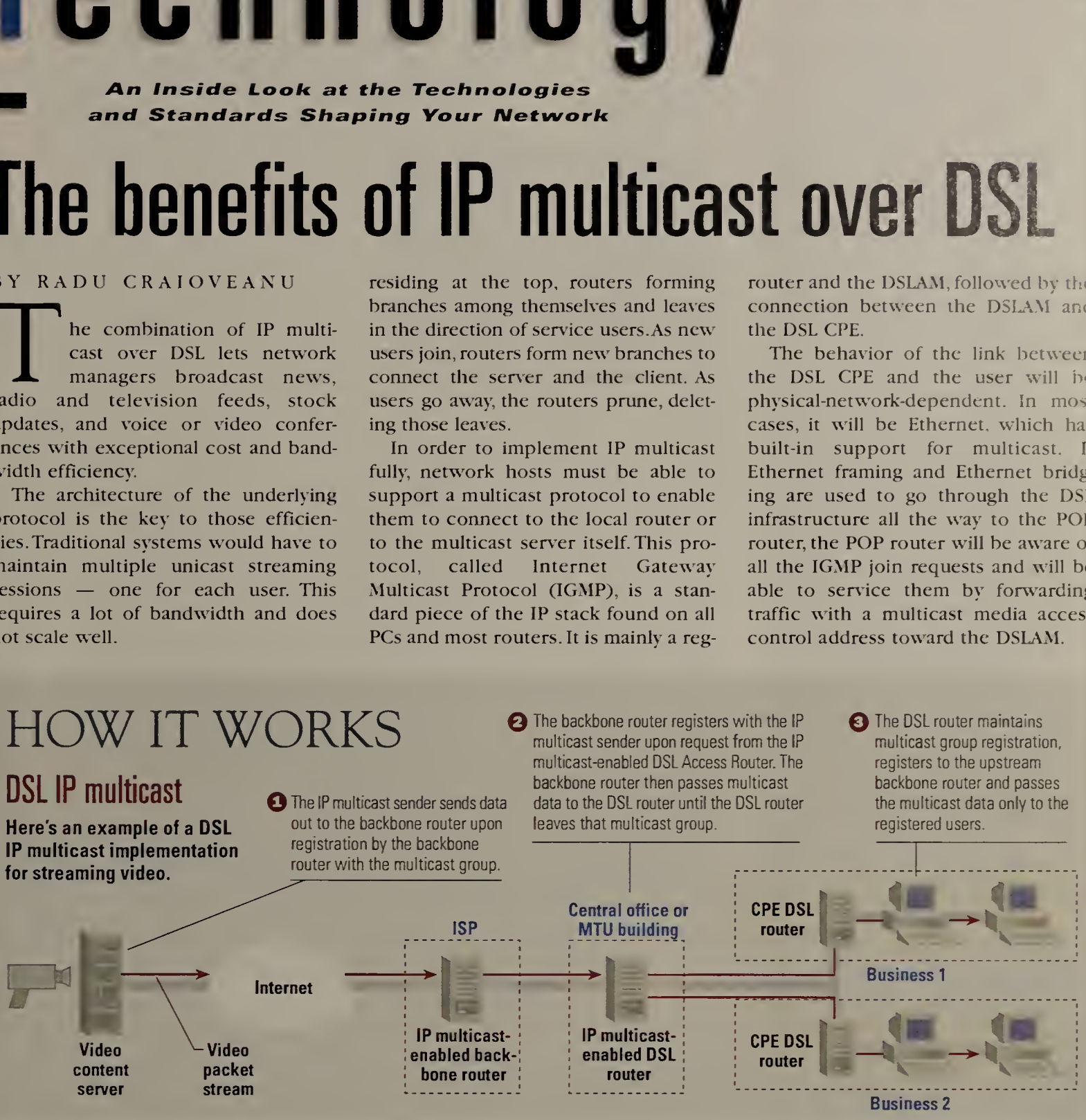
As Internet backbone pipes get fatter and last-mile connections keep pace with new broadband technologies, IP multicast presents tremendous, new opportunities. IP multicast over DSL enables IT managers to offer scalable, broadband-enabled technologies at a quality level never before obtained.

Radu Craioveanu is director of systems architecture at Interspeed, Inc. in North Andover, Mass. He may be contacted at radu@interspeed.com.

HOW IT WORKS

DSL IP multicast

Here's an example of a DSL IP multicast implementation for streaming video.



Gearhead — inside the network machine . Mark Gibbs

AirCard: A reasonably good way to stay in touch

Gearhead was delighted when an old friend, Tony Miranda, gave us a cool trinket: A radio frequency bug. This small device (just under an inch in diameter) detects RF signals. Put it near a cell phone and a sequence of flashing LEDs indicate when it has detected a transmission. Way cool.

One interesting thing the bug reveals is that digital cell phones "talk" to the cell they're in about once every 10 minutes, even when the phones are not in use. Much more often than Gearhead had expected, and frequently enough for governmental busybodies to get information on where you are . . .

But enough paranoia! This bug also detects the Sierra Wireless AirCard 300 we just started to check out.

The AirCard is a PC Card (the new name for PCMCIA) that provides a Cellular Digital Packet Data (CDPD) connection. CDPD is a neat hack that carries packet data over the analog cellular network.

The card has a stubby antenna that can be easily removed when you wish to stay streamlined, although the way it plugs into the

card is a little kludgey. It uses a miniature coaxial connector that can become stretched so the antenna keeps falling over — nothing a quick pinch with your fingers can't fix, but less than satisfactory.

The nominal data rate is 19.2K bit/sec (more on this later), which means you're not going to be downloading your mail or moving video files around. But you can access things such as stock tickers and corporate Web pages optimized for low bandwidth.

The card is compatible with Windows 95/98/NT, and Sierra offers cards for Windows CE as well as a multimode version that includes a cellular modem. And for the power mongers among you, Sierra also offers a version that plugs into a booster that increases the RF output from 600 milliwatts to 3 watts.

Installation was pretty easy once we removed all other network connections — and that is the first gotcha: Once installed, AirCard won't allow other network cards to work. Gearhead is speechless over this deficiency.

Be that as it may, once working, the AirCard is way cool. We used the AT&T wireless network, but there are several other carriers offering CDPD service. We ran a Web browser to check the massive Gearhead securities holdings and also managed to pick up some e-mail, but neither operation seemed reliable. Indeed, in New York last week (where it was -20 degrees, for heaven's sake!) the packet loss rate was around 30%.

Here in the Ventura office that Gearhead shares with that reprobate Mark Gibbs, there is no packet loss, at least at the odd hours (usually post-midnight) when Gearhead is in the office. The packet-loss rate seems to be directly related to network loading (we observed a low but still significant packet-loss rate when we were in our Los Angeles office).

Now about that nominal data rate of 19.2K bit/sec. Our research department reports that other reviewers rate the real throughput at something around 16K bit/sec. That wouldn't be too bad if it were true (are those guys overmedicated?). Our tests found a rate of around 8.33K bit/sec when pinging an Internet host with 716-byte packets, and an average of 6.32K bit/sec over the range of packet sizes from 56 bytes to 756 bytes.

In fact, the transmissions seemed reliable up to around packets of 426 bytes, after which timeouts occurred. This indicates that optimizing your applications under CDPD is highly desirable if you want to avoid reducing your data rate even further due to retries.

The AirCard 300 is a nice device and at $442 not too badly priced. Definitely worth checking out if you can make your mobile applications fit the bandwidth. You can get the cards direct from Sierra (www.sierrawireless.com) but sorry, we have no idea where to get the RF bugs.

Transmissions to gb@gibbs.com.

Vendors vs ASPs

When considering how to outsource your applications, you have a number of choices. High on the list is the decision on whether to go with a third-party application service provider (ASP) or lease applications from your vendors. USinternetworking argues in this week's Face-off (page 68) that an ASP has the wherewithal to manage several of your applications seamlessly. But Oracle says getting your applications straight from the vendor could mean quicker access to upgrades, better interoperability and solid support. Executives from both companies will be online this week to debate the issue.

DocFinder: 6721

Paying for progress

Last month, Rick Stevens and Tim Kuhfuss of Argonne National Labs told you about the Grid, a project to harness the world's computing power. The Grid is just one of many projects on tap that require cooperation from around the world.

But who's going to pay for these new efforts once they are rolled out to the public?

Kuhfuss and Stevens argue that the beneficiaries, such as big companies, should kick in money. Then again, the hardware manufacturers could see a boost in sales as a result of more powerful technologies. The answer isn't clear, but the pair take a stab at figuring out who should pick up the check in this week's "In the Works."

DocFinder: 6729

Satisfaction guaranteed

Employers are quick to complain that their employees are running for the door. But they often fail to ask themselves why. This week, the Career Doctor offers 12 tips for keeping employees satisfied, which leads to increased retention.

While some people might think that more money and a better position are the two drivers in employee turnover, Career Doctor Shaun Kelly says think again. Recognition for hard work and attention to well-being are among the top requirements for job satisfaction. Find out what else made the list.

DocFinder: 6730

Help Desk

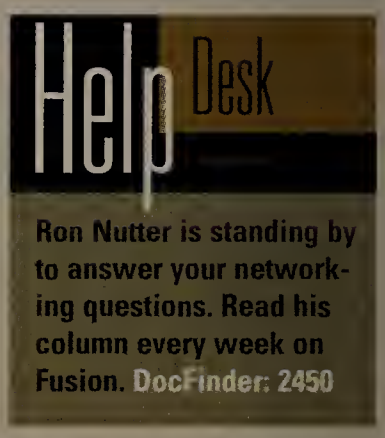
A reader is struggling with his NetWare 5 servers. He tried to install Service Pack 4 in his headquarters and two remote offices. While the headquarters install went smoothly, he encountered rough waters at the remote sites. "I went to the first branch office, loaded Service Pack 4 and I lost my WAN link," he says. The second office had the same problem. Could it be a problem with his SAA 4.0 Gateway? Or is there something the reader missed in the ReadMe file? Should he wait for Service Pack 4a? Read what Help Desk Editor Ron Nutter suggests.

DocFinder: 6731

LinuxWorld

Did you miss LinuxWorld Expo in New York last week? Well, we didn't. Log on to Fusion for all the news from the show as well as a page of Linux resources.

DocFinder: 6732



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Editorial

How to milk your friends

Even if you weren't counting, you could not help but notice that loads of dot-com companies were betting it big in the Super Bowl. Seventeen out of the 36 firms that took out $2.2 million TV spots were pushing something Internet-related.

Including Epidemic Marketing, Inc., which was hawking a perfectly horrible idea — a way to make money by embedding ads in the e-mail you send to friends and business acquaintances.

Individuals who don't mind spamming their fellow humans (the ad is unsolicited so I think it classifies as spam) can click over to Epidemic.com and sign up as e-Carriers. After you download a plug-in called an epiNabler, you're ready to paste epiAds into your mail.

Should an acquaintance click on an epiAd and actually make a purchase or "complete another specified activity sponsored by the advertiser" (their words), you earn a commission. (That is, if the acquaintance doesn't immediately trash your mail and disown you for stooping so low.)

Oh, and there is a pyramid scheme built in. If the recipient of the spam should decide to get in on the act and become an e-Carrier, you get 5% of their rewards for the following year.

Companies that have signed on as advertisers that e-Carriers can promote include American Express (you get up to $15 for each Amex item purchased by the mail recipient), Dell (.05% on goods purchased) and CarPrices.com ($1 per new car quote).

But the arrival of Epidemic raises some interesting questions for you:

- If employees start using Epidemic, how will that reflect on the organization? Can General Motors, for example, afford to be the source of e-mail stuffed with ads for American Express? Is it clear that the ad was the doing of the sender, or does it look like something endorsed by the corporation?
- What is your response if a business partner complains about getting spammed by your company's employees?
- Does use of Epidemic violate your acceptable use policies? Do you need to issue another policy regarding e-mail ads and, if so, how would you enforce the policy?

What do you make of this? And will you bother doing anything to head it off at the pass?

(Heck, if this idea takes off, I'm starting a company that stuffs ads in gaps in speech. "Hi, Mom [Drink Coke]. Is Dad there [Smoke Marlboros]?")

— John Dix
Editor in Chief
Jdix@nww.com

Message Queue

NOS REVIEW DRAWS FIRE

I was rather surprised to see Windows 2000 — a nonshipping, untested network operating system — beat out tried-and-true existing NOSes ("King of the NOS hill," Jan. 24, page 71).

Interesting: Windows 2000 beats out all NOSes in security, even though it has not yet shipped and has not achieved C2 certification with a network card. Two of the other NOSes have this certification.

Hmm, Windows also wins in scalability, though most people would laugh at this. Novell Directory Services 8.0 can hold a billion objects in the directory and handle terabytes of drive space, but apparently this is not very scalable.

Even more interesting is the stability category, in which Windows 2000 also wins. I have had Unix and Novell servers up for literally years, but a nonshipping product is deemed better?

Even with these discrepancies, Windows 2000 beat out NetWare by only 0.17. Imagine if the numbers were not biased toward a product that has not shipped or proven itself yet.

Gord Lawry
Rochester, N.H.

An error must have occurred in your scoring for scalability. Scalability certainly means different things to different IT professionals, but in the end it boils down to: "Can the product handle lots of users?"

In this category, your only graphic showed that UnixWare and NetWare had a clear edge over Windows 2000 in symmetric multiprocessing scalability (page 76).

And although scalability was weighted a hefty 20%, it didn't even warrant its own bold-type heading, and no insight was given as to why Windows 2000 scored higher in this category than NetWare.

Throw out the scalability score, and the results are different. Creative numerics by a publication with five full pages of Microsoft advertising and one quarter-page ad for Novell?

Michael Vance
Morning Sun, Iowa

Regarding your NOS review, I would like to see the project plan and testing results, as well as the matrix that was used to compare different features. This test promised a "showdown," but a summary of results does not allow for proper disclosure and thus cannot be seen as valid. The only testing I can see was file testing and TCP transaction testing, both of which confirmed NetWare's superiority to Windows 2000.

The remainder of the analysis, which made up 75% of the weighting, appears to be subjective discussion based on claimed features and downright exclusion of others.

Results are only valid when they can be quantified, and the only quantified results do not point to Windows 2000 as the winner of your showdown.

Dale Strawford
Technical support specialist
City of Regina
Regina, Saskatchewan

Test Alliance Director Christine Burns responds:

The project plan for the benchmark testing is outlined in the "How We Did It" section of the review (page 74), and the complete spreadsheet with those testing results is posted on Network World Fusion (www2.nwfusion.com/download/0124nos.xls).

However, we have received many inquiries as to how we arrived at the other ratings in our scorecard. We have also heard from many readers who point to other industry or vendor-run tests, which they say prove one NOS is better than another in these same categories.

Your points concerning security, stability and scalability are all well-taken. However, confirming C2 certification, pushing the directories in question to one billion users or keeping a server running for three years straight are not tests our reviewers could have replicated in the lab. Therefore, we had to judge these products on a more focused scale.

A complete listing of the facts contributing to each category is posted at www.nwfusion.com/reviews/nosresponse.html.

Send letters to nwnews@nww.com or John Dix, editor in chief, Network World, *118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.*

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MORE ONLINE

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DocFinder 6722

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The Lotus Position

Director's Cut . Paul Hoffman

LACK OF AGREEMENT ON PKI BODES ILL FOR VPN USERS

If you're deploying a public-key infrastructure (PKI) and expect your mission-critical applications, such as virtual private networks (VPN), to connect instantly, think again. Lack of a clear focus for PKI, coupled with a lack of interoperability across all PKI-using systems, will cause untold delays in getting products to work together.

A few weeks ago, I conducted an informal survey at a VPN interoperability bakeoff in San Diego. The purpose of the survey was to let certificate authority vendors know what VPN vendors are implementing and to let VPN vendors know what the others are doing so they can reach agreement on how to proceed with certificate authentication in IP Security. The results were depressing.

There was no general agreement on enrollment, the mechanism by which a VPN gets its own certificate, usually when you install the system. About 80% of the vendors surveyed support manual or Web-based enrollment using a fairly standard request format; unfortunately, they were almost evenly split regarding the format for the response they expect from the certificate authority. In a stunning rebuke of the standards process, only a handful of vendors used the IETF's Certificate Management Protocol (CMP) standard. The fledgling Simple Certificate Enrollment Protocol, which was cobbled together outside the IETF and made public only last month, had more users, despite its obvious technical problems.

The good news is a solid majority of VPNs check the revocation status of the certificates they receive. This is particularly important for VPNs used in extranets and in corporate networks that assume if a user got in through a VPN, he should have wide access to resources on the net. The bad news is there was no agreement on how to find revocation information. No common methods (checking revocation information given with certificates; manual checking with Lightweight Directory Access Protocol or HTTP; checking at locations listed in a certificate) were supported by more than half the implementers. Even though all VPN systems are online, none of the implementers was using the IETF's Online Certificate Status Protocol standard.

Perhaps the most depressing discovery was that almost one-third of the VPN vendors didn't support chains of certificates: They required all incoming certificates to be signed directly by a trusted root. No one ever said that verifying a path of certificates from the one you are given to one you trust is easy, but it is pretty much a requirement if we expect PKI to scale beyond today's small number of users.

The blame for this mess can't be laid solely on VPN vendors. Certificate authority vendors have been slow to roll out support for CMP and have often pooh-poohed the need for good revocation checking. And the IETF has not made certificate path validation easy (the PKI X.509 Working Group is now considering a major clarification to the rules). The result is not pretty for the VPN industry and bodes poorly for other markets that rely on certificates, as well.

Hoffman is director of the VPN Consortium and the Internet Mail Consortium. He can be reached at paul.hoffman@vpnc.org.

Above the Cloud . James Kobielus

EDI AND WORKFLOW CONVERGE IN E-BUSINESS TOOLS

Every network software vendor worth its stock options is repositioning its offerings for the business-to-business (B2B) e-commerce, or e-business, market. For some vendors, the move is just a superficial marketing campaign, a matter of applying new labels to old shrink-wrap. However, much of it reflects profound re-examination of vendor product directions and architectures.

E-business is an architectural mess, and vendors know it. Enterprise customers are scratching their heads trying to figure how to link their internal business processes with those of trading partners and not plunge themselves into a vortex of technical headaches and integration costs. No robust standards have yet emerged to support interoperable, cross-platform e-business. The industry is nowhere near delivering anything resembling plug-and-play technical integration at the B2B level.

E-business is also a conceptual mess. E-business software vendors are trying hard to help customers sort through all the integration issues, but vendors are still groping for a conceptual handle on it all. The typical e-business software vendor's product roadmap invokes such familiar, but vague, topics as customer relationship management, electronic data interchange, enterprise application integration and enterprise resource planning (ERP).

Yet the basics of e-business are quite simple. They revolve around two familiar technologies that companies have implemented for years: EDI and workflow. E-business interoperability frameworks that succeed will be those that define mechanisms for integrating structured B2B workflows with traditional EDI.

EDI and workflow have been separated by their divergent spheres of application: EDI for structured document routing between companies; workflow for structured routing within each organization. What's uniting these two technologies is the new concept of the "virtual business" — an amorphous organization with evolving external boundaries, role definitions and procedures. The virtual business is constantly repositioning itself through dynamic alliances with an ever-changing set of trading partners.

An Internet-based trading community can thrive only where all participants share a common process model — an agreed-upon set of business rules that govern structured transactions. Just as important, all participants will have to implement a common B2B interoperability framework that allows them to enter easily into new trading relationships without the need for costly, time-consuming, multilateral coordination of legal agreements and technical interfaces.

For that to happen, you need an interoperability framework that seamlessly integrates EDI and workflow. The various proposed frameworks — most notably, BizTalk and the XML/EDI Group's initiative — are driving toward the same bright spot on the B2B horizon, encapsulating EDI transaction sets in message envelopes that specify workflow parameters and transaction state variables. However, it remains to be seen which, if any, will gain the necessary multivendor support. It might be five to 10 years before a dominant, universally implemented B2B interoperability framework emerges.

Until then, enterprises will have to rely on a new generation of B2B workflow products that bridge incompatible environments. One noteworthy product family is Mercator Software's E-Business Broker suite, which was announced last month. The E-Business Broker suite provides tools for defining structured workflows, inter- and intra-organizational, and implementing these through a suite of server-based "brokers," which are essentially run-time workflow engines. The brokers validate, map, translate, manipulate and route EDI documents, ERP system outputs, and other objects between dissimilar applications and systems.

Microsoft's forthcoming BizTalk Server boasts a similar concept — an all-purpose document mapping, translation and routing engine — but it's clear that Microsoft is not prepared to match Mercator's multiplatform strategy. BizTalk Server will run only under Windows 2000, and the BizTalk Framework assumes that trading partners have primarily implemented Windows-based applications that can process BizTalk messages and documents. Microsoft's framework assumes platform homogeneity in a B2B world that will remain stubbornly heterogeneous and multiplatform. To be fair, I should point out that Mercator's products assume that trading partners use SAP AG's ERP products and implement B2B workflows across a predominantly SAP-based environment.

All of this goes to show how difficult it will be to achieve end-to-end, multiplatform B2B workflow integration in the messy real world.

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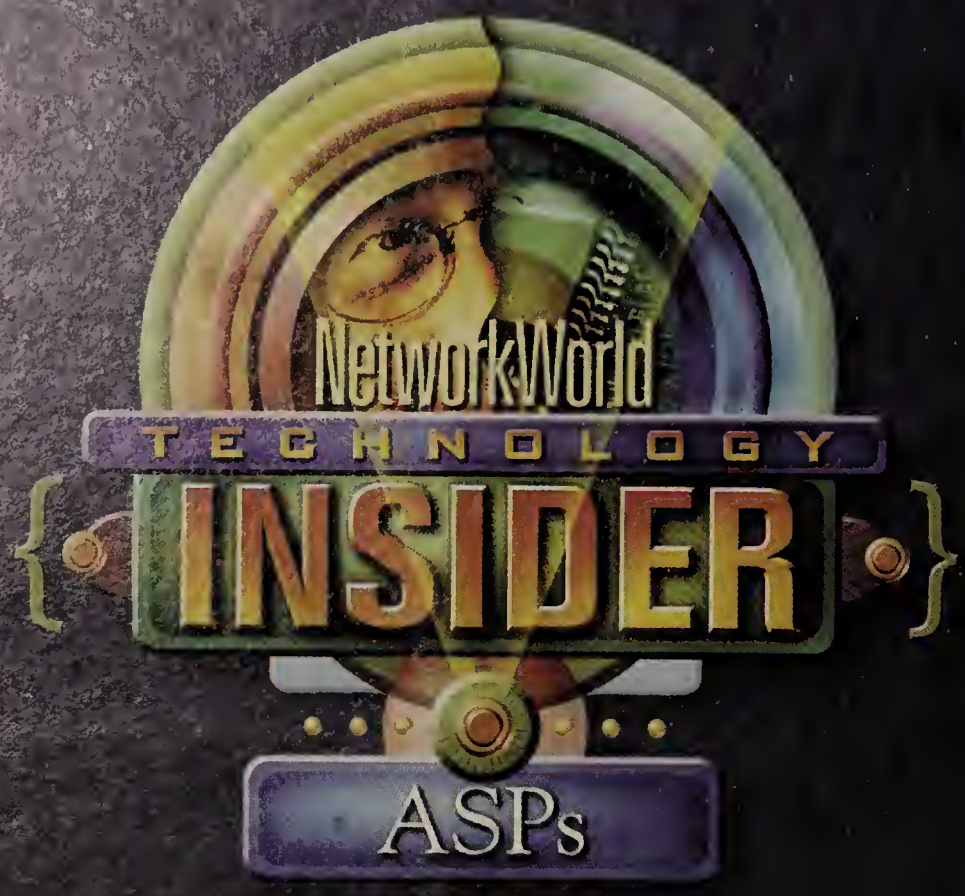

Welcome to the first edition of Network World's Technology Insider, an in-depth series targeting today's hot network technologies.

In this bi-monthly feature, we'll cut through the vendor hype and tell you exactly what role these technologies will play in your enterprise network. Our Technology Insider series will include investigative reporting, analysis, opinion, reader insights, user case studies, Management Strategies pieces, product reviews and Buyer's Guides. Our coverage begins with a look at the hottest technology going — ASPs. In the story that begins on this page, reporter Lauren Gibbons Paul traces the rise of the ASP phenomenon and highlights the risks and rewards of the application rental model. The series continues with:

Case study #1: Paul Marshall wanted to add real-time messaging to his company's Web site, but he knew his IT staff was already swamped with projects. When an ASP said it could deliver the application in seven days, Marshall jumped at the opportunity. **Page 62.**

Case study #2: When the financial folks at his company wanted to hire an ASP to host mission-critical business applications, IT director David Blumhorst was skeptical. Start-up Corio changed his mind. **Page 64.**

Case study #3: Flash Electronics didn't have the money, the people or the time to install SAP R/3 manufacturing modules. So, Flash took a chance on a start-up called Applicast. **Page 66.**

Face-off: Should you rent applications directly from the software vendor or from a third-party ASP? **Page 68.**

Management Strategies: Tips for managing your ASP. **Page 70.**

THE AS PHENO

Will the software rental model change your life? Maybe not. But if you need to get an application up and running fast, and if you don't have the resources to do it in-house, an ASP may be the answer.

BY LAUREN GIBBONS PAUL

If you're confused by the sudden explosion of application service providers (ASP), you're not alone. ASPs are popping up faster than Internet initial public offerings. Everyone from pure ASPs, such as Corio and Interliant, to established software vendors, such as Microsoft and Oracle, want a piece of the action.

And the range of applications you can rent is getting broader every day, from e-mail to messaging to customer service to human resources to finance to manufacturing.

The good news is that the concept underlying ASPs is blessedly simple. All you need to know is that ASPs are offering a different business model, an alternative way of delivering software over the Internet or a private VPN.

The ASP model is hardly new. It's very similar to time-sharing mainframe applications from service bureaus. What killed time-sharing 20 years ago was the advent of the PC. Today, several factors have aligned to make the rental scheme viable again:

1. On the vendor side of the equation, the Internet is by far the most important enabler. Even though most ASP applications today are actually delivered over private networks, the vision is that as the Internet becomes more reliable and secure, applications will be delivered over the Web. Two other factors setting the stage for the rise of ASPs are advances in server-based computing and access to

SP
MENON

increased bandwidth, says Hal Chapel, chairman of Xevo Corp., which sells infrastructure software to ASPs.

2. Software vendors need a better way to sell to small and midsize businesses. Most large companies have implemented enterprise resource planning (ERP) and sales force applications by now, and vendors such as SAP and Baan need a way to make their offerings palatable — both in implementation time and price — to the lower tiers of the market. Although some software companies are threatened by the ASP trend because they believe it will dilute their brands, many companies embrace it as a way to tap a fresh market.

Vendors like the rental model because it gives them a steady revenue stream, rather than a "license-signing frenzy" at the end of each quarter, says Josh Greenbaum, principal at Enterprise Applications Consulting in Berkeley, Calif.

3. On the user side, three factors are converging to ignite interest in renting applications, according to Lew Hollerbach, senior analyst at Aberdeen Group, a market research firm in Boston.

- Competitive pressures are forcing businesses to re-emphasize their core competencies, which can lead to outsourcing their IT functions.
- Companies are finding it impossible to hire and retain the right people to build and maintain their systems internally.
- IT managers are struggling to get e-business initiatives up and running quickly on limited resources.

Increasingly, companies are loathe to deal with IT systems at all, says Phil Wainewright, managing editor of the "ASP News Review," an online ASP industry publication in London. "IT has gotten harder to do. It's 24 hours per day. The stakes are higher and everyone is overstretched. The ASP value proposition is, you pay us a monthly fee and we'll take care of all that for you — and to guaranteed service levels," Wainewright says.

At this point, the ASP phenomenon is one of high-decibel levels and low numbers of actual customers. For example, Corio, one of the leading ASPs, had a total of 38 customers as of early January. Many ASPs are caught in the bind of having to prove they are reliable and scalable, when they often don't have customers to back up their claims.

"Many ASPs are using an Internet financial model to build their companies. They're drumming up a lot of venture capital and predicating their strategy on

10 questions to ask before signing on with an ASP

1. **Can the vendor guarantee 99.9% uptime and application availability?**
2. **How can the vendor guarantee my data is secure?**
3. **Am I trusting my data to a viable and stable company?**
4. **Can I trust that my application will run efficiently on the vendor's network?**
5. **Will the vendor be able to support all my customer service needs, the network and the ongoing application management?**
6. **Can the vendor handle all my implementation needs?**
7. **Should I be threatened by the loss of control?**
8. **Is this a cost-effective solution over the long term?**
9. **If I want to bring my service back in-house, can I do that?**
10. **Am I the first to consider doing this out of house? Are other companies doing this?**

A SAGE DECISION

In many ways, Dave Charlton personifies the typical ASP customer. As chief operating officer and chief information officer at Internet start-up AllHerb.com in Laurel, Md., Charlton two years ago needed outside help to create the company's site, which sells herbal remedies (see "ASP advice," page 70).

So he turned to Pandesic, a joint venture of Intel and SAP AG, to build, host and maintain an e-commerce site based on SAP's R/3 enterprise resource planning package for a usage-based monthly fee. To Charlton, the benefits are clear: Tiny AllHerb.com, with just 25 employees, could not afford to buy R/3 outright, and the site was up and running in just eight weeks.

"We could never have done this ourselves. I would probably have to have six people on staff to develop and maintain this — assuming I could even find them. Pandesic develops once for all their clients. It's much more efficient," Charlton says.

He also believes the ASP model provides greater scalability. When the site launched, it ran on two shared servers at Pandesic's data center; now — six months later — the site uses five shared servers. Rather than having to invest for future growth, Pandesic's solution is pay-as-you-grow.

The ASP model of renting rather than buying software applications is indeed compelling for dot-coms such as AllHerb.com. For many small and midsize companies, renting the application is the only way they can have access to high-end packages such as R/3. Because start-ups have no legacy systems, the fact that going with an ASP usually means foregoing customization is generally not a problem.

But the "rent-an-app" delivery model is increasingly attracting larger companies whose IT departments are too strapped in both financial and human resources to take on customer-facing e-business projects. Not surprisingly, the ASP market is poised for rapid growth. The Dataquest unit of market researcher Gartner Group estimates the worldwide ASP market will reach $22.7 billion by 2003.

And Charlton says the value he's getting from his ASP today is nothing short of miraculous: "We just love it."

— Lauren Gibbons Paul

gaining customers at all costs. They are desperate to prove themselves," Greenbaum says. "They're willing and able to show a loss on their early customers."

And many companies are willing to take a chance on an ASP — for them, the potential rewards are simply too tantalizing. The chief advantage is speed. Using an ASP is an undeniably quick way to get an application up and running. And at least in the near term, it can be the least expensive way, too. Many ASPs will install the application, and customers have the option of rolling that cost into the monthly service fee, which is based on usage. Many ASPs offer a sliding scale so fees drop as volume grows.

The ASP model also insulates customers from technology creep. That was a big selling point for Paul Marshall, senior director of customer support for Yellow Freight System, a $1.9 billion shipping company in Overland Park, Kan. Marshall wanted to add interactive messaging to his company's Web site but was hesitant to implement this capability himself, despite Yellow Freight's in-house IT expertise (see "Getting the ASP message," page 62). "Technology moves so quickly. I didn't want to have to upgrade or replace something right away," he says.

Risky business

Of course, there is a downside to taking the ASP path. Customers must trade internal control and the ability to customize for the speed and cost advantages of the ASP model.

And it is risky to bet your business on the performance promises of third parties outside your immediate control — especially when those third parties are relying on fourth parties to provide the service. For example, nearly all ASPs partner with other companies to provide the physical data center where the applications are hosted. That's why guaranteed service levels — where the ASP takes ownership of the entire user experience — are crucial.

The lack of customization may not be a problem for a start-up that has no legacy systems and no entrenched business processes. But midsize and larger companies should never consider renting a vanilla ERP application, Greenbaum says. "You can't be competitive with a generic ERP implementation," he says.

Another issue: Current applications were written under the presumption that one company would own one copy of the software running on one server. Unexpected downtime and other problems can result as ASPs run multiple copies of the application on the same server. But this problem should take care of itself because the next application versions will come in a multitenancy format. Microsoft, Oracle, SAP and other major vendors have announced forthcoming versions of their applications that will be designed to be used by ASPs.

Security can be another bugaboo. Some industries will only adopt the "rent-an-app" model if they can access it on a dedicated, secure line, which is what most companies do when they elect to have their mission-critical applications hosted by an ASP.

What's ahead?

Although the ASP market is growing rapidly, it faces serious challenges. Not the least of these is simple confusion — there are so many players offering so many different applications targeting so many different industries.

Plus, if service levels begin to suffer as more customers flock to ASPs, that could damage the concept very quickly.

Consolidation among the more than 150 companies in the market is inevitable in the next 18 months. Some observers believe the market will swing toward independent software vendors (ISV), which increasingly will offer a hosted model along with the traditional licensing structure. It remains to be seen whether this will occur, as ISVs have good reason to feel threatened by the popularity of the ASP model. When customers begin to look at their software applications as a utility, that dilutes the ISVs' power and influence — not to mention their brands.

Several analysts say software companies should stick to their knitting. "Hosting software is a whole different business than developing software. Most software companies will never be in a position to become services companies," Greenbaum says.

Hollerbach agrees. "An ISV's core competency is not hosting, it's writing software," he says.

ASP proponents believe the application hosting model will forever change the way companies use information technology. "The IT industry is a products industry. It's now transforming into a service industry. Ten years from now, when you think IT, you'll think service, you'll think subscription," says Jonathan Lee, founder and chief strategy officer at Corio in Redwood City, Calif.

The application rental scheme may not take over the world, but one thing is clear: The metrics by which ASP customers gauge their provider's performance will become increasingly sophisticated — and increasingly tied to realizing business value.

Today, ASP customers measure their providers in terms of uptime, bandwidth, scalability, security and problem resolution, according to a report by Adrian Gonzalez, senior analyst at ARC Advisory Group, a Dedham, Mass., market research firm.

Tomorrow's metrics will cover cost savings, cycle-time reduction, customer retention and supply chain efficiency. According to Gonzalez, customers will be less interested in software applications, hardware platforms and other enabling technologies. Instead, they will focus on the business value offered by the ASP. ◪

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ASP ACCESS

We've got forums, interactive charts and ASP resources aplenty. Here are the highlights:

Face-off: Which is better – going with a third-party ASP or leasing applications from the vendor? Oracle's Tim Chou and USinternetworking's Jeff McKnight are online this week to debate the issue. DocFinder: 6721

There are seven categories of ASP providers. Go online for a chart to help you sort it all out. Plus, links to ASP resources. DocFinder: 6726

Tips: Find out how to construct an ASP service-level agreement and learn what to expect from your ASP. DocFinder: 6728

Resources: Case studies, overviews and a technology-specific search engine. DocFinder: 6727

find it DocFinder 6726 online

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GETTING THE ASP MESSAGE

Shipping company beats competitors to the punch by launching real-time chat on its Web site in seven days.

BY LAUREN GIBBONS PAUL

Paul Marshall knew one thing when he set out last June to add real-time messaging to his company's Web site: There was no way he could ask his internal IT department to develop and maintain the application.

As senior director of customer support for Yellow Freight System, a $1.9 billion shipping company in Overland Park, Kan., Marshall knew the IT people were already so consumed with other projects that it would take at least six months just to get a prototype. Marshall didn't want to wait. He needed a quicker way to add human interaction to the company's package-tracking Web site.

"The idea was not to take the place of the Web site, but to increase the site's 'stickiness' so people would come back," Marshall says. He envisioned a real-time chat application where users could engage in a written dialog with a customer service person if they needed help while tracking their packages on the Web site. The goal was to off-load some of the burden on the call center. Marshall believed calls to the firm's 800 number would decrease as self-service traffic on the site increased.

Marshall was also worried that an online messaging application developed in-house would rapidly become obsolete. He wanted to avoid getting on the upgrade treadmill if at all possible. Scalability was another issue. He didn't want to have to pay today for capacity he might never need.

The solution presented itself after a routine Web search one day last June. Why not outsource the development and hosting of the messaging application to FaceTime Communications, an application service provider (ASP) in Foster City, Calif., that hosts its own software application, FaceTime Message Exchange? Although the ASP model was not getting much press at the time, Marshall intuitivcly saw how this form of selectivc outsourcing could solve a lot of his problems. He fired off an e-mail to the company.

FaceTime's proposal amazed him. "They said they would have the application up and running in seven days," Marshall says. He was also impressed with the pricing structure, which was based on usage. The charges start at $250 per customer service agent, per month; implementation costs average about $5,000.

MPG/DOUG HESSE

But Marshall worried about security. Hosting the application would require behind-the-firewall access. And because the Internet would be the transport mechanism between FaceTime's data center provider and Yellow Freight headquarters, he wasn't sure if this would meet Yellow Freight's strict data security requirements.

"We were giving them the keys to the front door. We had to stop and think about this," Marshall says. So, he put the corporate security expert on the case. That person spoke to FaceTime officials and became satisfied that the application would be secure, for a number of reasons, according to David Hsieh, vice president of business affairs and co-founder of FaceTime.

First, the FaceTime application features Secure Sockets Layer encryption. Second, the application uses a proprietary protocol that rides on top of TCP/IP, making it very difficult for someone to spoof or crack. Third, the application — live chat between a customer service representative and a customer — isn't very sensitive. Yellow Freight's security expert agreed to open the company's firewall to FaceTime's pre-identified set of IP addresses.

Financial security was another risk of going with FaceTime. The company was a start-up and had no customers when Yellow Freight initiated talks. However, Marshall was impressed with the credibility of the company's founders. "They had some pretty good venture capital, and they had an application. They were ready to do business with us," he says.

So far, Marshall has been very pleased with his decision. Site traffic has increased from about 20 users per day to several hundred, and the costs are reasonable, he says.

Performance has been excellent, and the FaceTime staff is very responsive when problems crop up. FaceTime truly owns the application and the user experience, Marshall says. "They don't just sell you something and walk away. They have a lot of skin in the game," he says. "The application is up to date. It's not my problem — it's theirs."

It's still too early to gauge how much the application has lightened the load on the call center, but Marshall is convinced it has. And he's proud that Yellow Freight was the first freight carrier in its market to offer live contact on a Web site. "The hosted solution was the best — the only alternative for us. Otherwise, we would not have been able to do it," Marshall says. ◪

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THE NEED FOR SPEED

Clarent Corp. uses an ASP to jump from PC-based accounting tools to PeopleSoft package.

BY LAUREN GIBBONS PAUL

You could call David Blumhorst a convert to the application service provider (ASP) model.

Blumhorst, director of IT for Clarent Corp., was highly skeptical when the financial people at his company suggested hiring an ASP to install and host a PeopleSoft enterprise resource planning (ERP) application. "My first reaction: 'You want me to take our most critical application with our most critical data and put it outside?'" Blumhorst says.

While Blumhorst strongly resisted the idea, in his heart he knew his company needed to upgrade its outdated PC-based accounting package. The Redwood City, Calif., IP telephony provider had undergone explosive growth in its four-year history and went public last July with 300 employees.

From inception, the accounting/finance group ran its operations on Intuit's QuickBooks and Microsoft Excel. That wasn't so bad in the days when there was only a handful of employees, but by late 1998, Clarent had surpassed the maximum number of users allowable on its software licenses, and the business/financial people had to share their core applications. The situation was rapidly progressing from an annoyance to a full-blown hindrance. "I knew we were not going to survive on that," Blumhorst says.

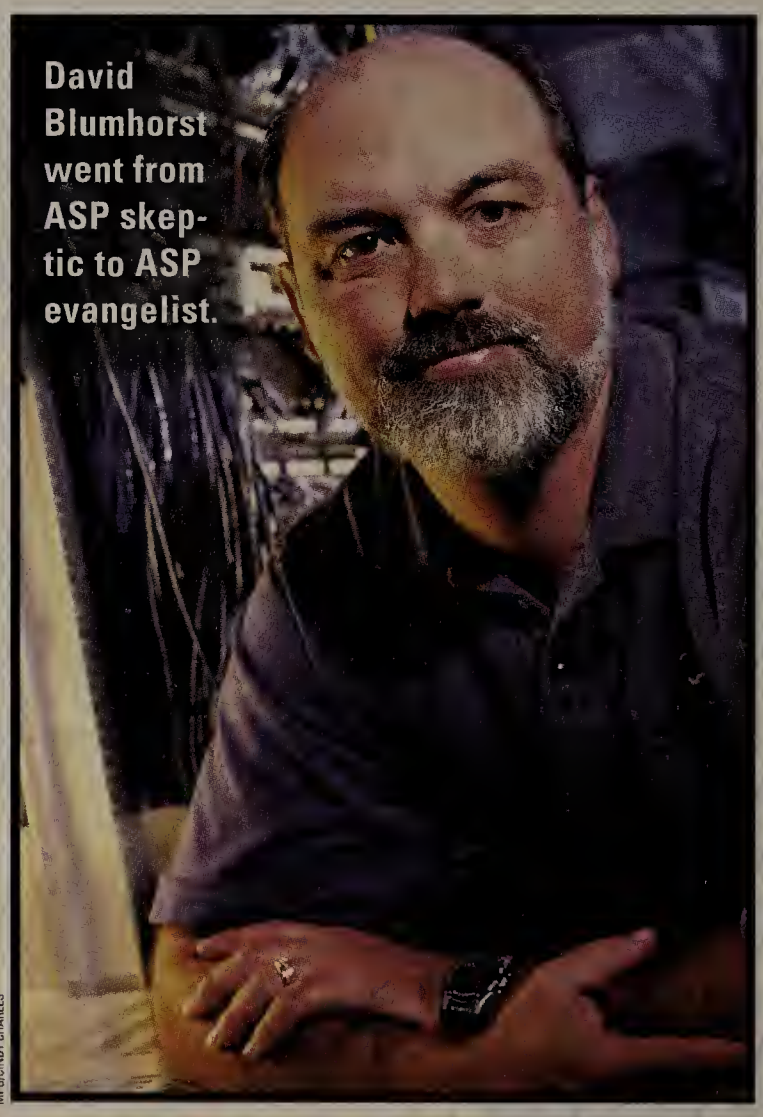
A logical next step was to implement a so-called second-tier application, such as a package from Great Plains Software or Solomon Software. But Blumhorst worried that at its current growth rate, Clarent would soon outstrip that level of product. He also wanted to obtain some features, such as electronic workflow and an advanced configurator usually reserved for first-tier packages. Furthermore, he figured he would need a product such as SAP's R/3 or PeopleSoft in a year or two, and he did not want to spend the time and money migrating the data off an interim solution down the road.

But Clarent could not afford the more than $500,000 it would cost to buy and install its own PeopleSoft system. Plus, Clarent would have required extra staff, and finding and retaining individuals with PeopleSoft skills is nearly impossible on the West Coast.

So, when the controller at Excite@Home told Clarent's controller about renting PeopleSoft on a monthly basis from Corio, many of Blumhorst's colleagues thought that was the way to go.

"The rest of the team was drooling. I was dragging my feet," Blumhorst says. His business unit colleagues could not understand his reluctance. The accounting department, for example, was more comfortable with the application rental model because payroll has been outsourced forever. Peer pressure finally prevailed. Because Corio was also located in Redwood City, Blumhorst decided the least he could do was visit the company and check out its reliability and scalability claims.

Although Corio had only one customer at the time — Excite@Home — Blumhorst quickly became convinced that Corio could do a good job handling Clarent's application. "I checked out their facilities and their data center [run by Exodus Communications]. I had to go back and say, 'You're right.'"


David Blumhorst went from ASP skeptic to ASP evangelist.

MPG/CINDY CHARLES

What finally convinced him was the realization that Corio had hired better PeopleSoft experts than he ever could. Because it had spent so much time waiting for Blumhorst to come around on the ASP topic, the Clarent search team didn't bother looking at any other ASP. Time was of the essence.

The project kicked off in April and the installation went live in August, on time and on budget. Clarent paid a one-time fee for the installation, which included on-site training and moving its existing data to the new system.

Blumhorst declined to specify the amount, but an average implementation costs between $30,000 and $100,000. As for the monthly usage-based fee, which analysts say ranges from $25 to $2,000 per user, per month, Blumhorst would only say Clarent's costs are at the high end of the scale.

Clarent's 30 PeopleSoft users access the application via a virtual private network on a dedicated T-1 line. And according to Blumhorst, no network upgrades were needed to accommodate the new application.

Clarent did not customize its PeopleSoft application, with one exception: The team added the ability to capture serial numbers of components within its telephony gateways in order to provide proper servicing of those units.

But Blumhorst doesn't think the overall lack of customization has hurt his company's use of PeopleSoft. "We didn't have ingrained legacy business processes. We didn't have legacy data. Our business processes were pretty plain-vanilla," he says.

Corio founder Jonathan Lee says companies are fed up with the prospect of customizing enterprise packages such as ERP and customer relations management (CRM). "CIOs of large corporations tell me that they're sick of 20 years of custom, custom, custom," says Lee, who is also chief strategy office for Corio. "These things don't add any value. Siebel, Siebel, Siebel [a leading CRM package]. You've got it, I've got it and my next-door neighbor has it."

These days, Blumhorst is nothing short of an ASP evangelist. "The ASP model is a great way to go. All the things they promised are actually true. I don't have to devote my staff to it. Corio has experts who do this day and night." ◪

IT'S BACK, AND IT STILL MEANS BUSINESS.

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NO FLASH IN THE PAN

Fast-growing Flash Electronics upgrades to SAP R/3; Applicast installs, configures, hosts software for a fee.

BY LAUREN GIBBONS PAUL

The handwriting was on the wall for Flash Electronics' old materials resource planning (MRP) package. Although the product was created for companies in Flash's industry — contract electronics manufacturing — it was not designed for global companies. There was no ability to share data among several different locations, for example. And Flash was planning to expand out from its Fremont, Calif., headquarters.

So when $40 million Flash began to experience triple-digit growth in the late 1990s, it became clear the company would need to upgrade to enterprise resource planning (ERP) software, which represents the next generation of MRP. Ed Hayes, vice president of corporate development for Flash, had his heart set on a robust tier-one package such as the SAP R/3 suite.

"We started looking around for someone to help us implement it. But we have a very lean, low-margin business. We had to get a good return on our investment," says Hayes, who headed the product selection team. "We had a very small MIS team with no expertise with packages like R/3." Hayes quickly realized that buying R/3 outright was not an option. Perhaps because he worked for an electronics parts outsourcer, the concept of outsourcing quickly presented itself as a viable alternative.

"Just like companies outsource their manufacturing of electronics products to us, we were going to have to outsource our IT to someone else," he says. "It was to our advantage at this point in our growth to go with someone who was already trained and equipped, and we expected to benefit from sharing fixed costs with other companies."

A member of the selection team was referred to Applicast, a Mountain View, Calif., application service provider (ASP) that targets small to mid-size companies experiencing rapid growth. The Flash team was very impressed with Applicast, a start-up founded by former Bay Networks executives — even though the company had only one other customer at the time.

Hayes wasn't overly bothered by the thought of trusting critical business systems to a relatively inexperienced ASP. "We took a chance on this company," he says. "There was a higher risk involved, but we believed in the people." The potential benefit of upgrading to a modern ERP system for a modest upfront and monthly maintenance cost outweighed the possible downside of outsourcing a critical application to an unproven company.

So Flash signed on with Applicast to provide the five major R/3 financial and manufacturing modules. It took four full-time Applicast employees about seven months to configure the system and get it up and running, without any customization of the modules.

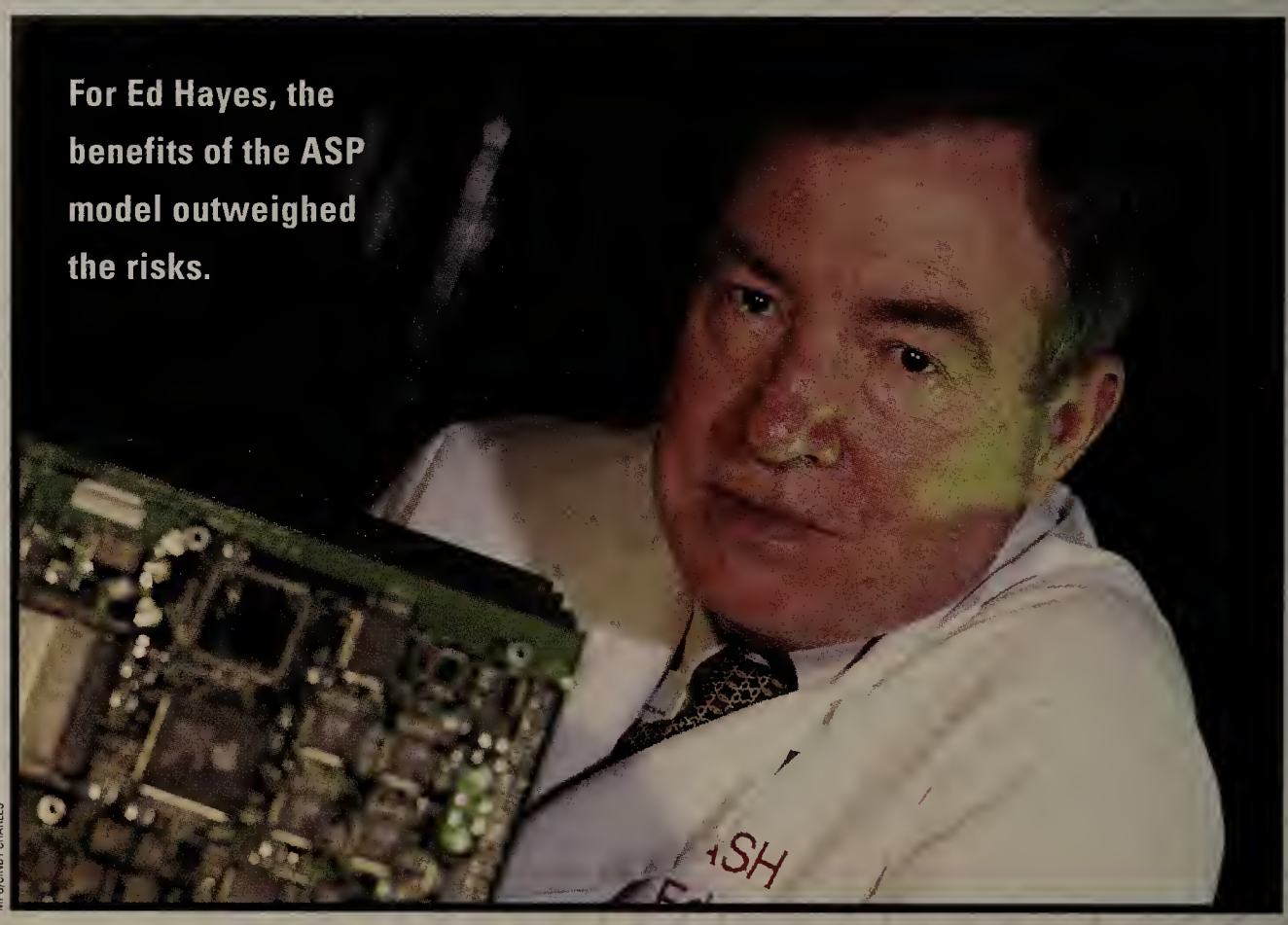
Since Flash was not a new company (it was founded in 1994), it did have legacy data from its Manex Systems MRP package that needed to be migrated.

An even bigger issue was the fact that Flash had entrenched business processes. The company elected to adapt its business processes to R/3, rather than vice versa, but this can be a risky proposition. Companies must guard against throwing their organizations into turmoil by making users change the way they work. And there is always a risk of unwittingly obliterating a process that gives a company a competitive advantage.

"Companies must never trade off customization for the convenience of the ASP model," cautions Josh Greenbaum, principal at Enterprise Applications Consulting, a consultancy in Berkeley, Calif.

But Hayes is sanguine about the customization trade-off that was part of going with an ASP. "We weren't big enough to start tweaking the code. We fit our business processes to them." He reports the business process changes have not been burdensome, and the 20 regular R/3 users have adjusted to the system. They especially appreciate R/3's sophisticated reporting capabilities.

With installation complete, Hayes is thrilled with the results: "It's like when you buy your electricity. You expect flawless performance. That's what we've been getting. And we couldn't have done it ourselves." ◩



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INSIDER ASP

FACE-OFF

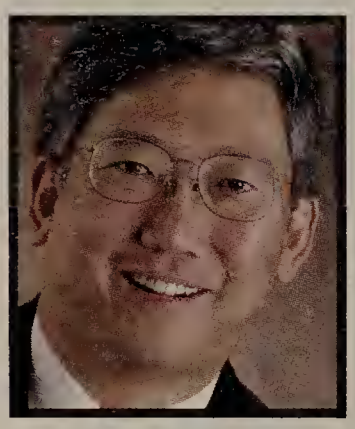
Use a third-party ASP or lease applications from the vendor?

ASPs offer a wider variety of leading software; vendors boast of greater expertise and accountability.

VENDOR SIDE

BY TIMOTHY CHOU

In September 1998, Oracle became the first major applications vendor to offer application service provider (ASP) services based on its own applications and database technology. Since then, other enterprise resource planning vendors have tried to jump on the ASP bandwagon by using third-party hosting services to offer their applications online. By choosing to run its own applications and technology rather than partnering with a third party, Oracle is able to provide tight integration, accountability and expertise.



Oracle Business OnLine runs Oracle applications, based on Oracle technology. Our developers write the code for everything from the database to the applications and set standards for the development of partner software. Our natural expertise with our products allows us to offer support that no ASP can match. Furthermore, Oracle's hosting model allows customer feedback on applications to funnel directly to the development team. This process enables us to truly meet customers' needs when formulating the next generation of Oracle applications.

Third-party ASPs, on the other hand, run software from many competing vendors, all built to different standards and specifications. Third parties do not have expertise on the software they host; they merely provide the technology to outsource the software from the vendors.

In terms of integration, Oracle Business OnLine offers an e-business suite that includes applications that span the front and back office. Any additional software added to the solution must first meet standards set by us. Partners agree to build the products to these standards and commit to our scheduled product-upgrade dates. This approach makes upgrades painless. Because third-party ASPs paste together myriad applications and require middleware to make those applications work, the integration is often loose and product upgrades can be difficult.

Additionally, the third-party ASPs' mixed-bag approach to application hosting makes it unclear where accountability lies — with the host or the application vendors. Because vendors are in charge of their own technology and applications, there are no integration issues and customers have only one point of contact for all applications and hosting needs, providing for clear accountability.

The main goal of today's ASP is to deliver core business functions via the Internet using tightly integrated applications — quickly, reliably and cost effectively. This can only be achieved when a vendor controls the applications and the underlying technology.

Chou is president of Oracle Business OnLine, an e-business Internet application software hosting service in Redwood Shores, Calif. He can be reached at chou@us.oracle.com.

ASP SIDE

BY JEFF MCKNIGHT

Application outsourcing has been around for a while. But with an ASP, for the first time you can obtain a variety of best-of-breed software from a single source without having to buy the licenses, build the technological infrastructure or hire additional IT staff.

Vendors will gladly sell you hosting services, network equipment, hardware, software and consulting expertise, but only a true ASP will assume total end-to-end responsibility for your operation. In addition, an ASP will provide the required computing hardware and necessary professional services, secure network connectivity to authorized users, and handle scaling and upgrades to the system — all for a flat monthly service fee.

By offering best-of-breed applications from a variety of companies and having the ability to integrate these packages, third-party ASPs provide an option that individual software vendors cannot offer. For example, USinternetworking can provide a Siebel sales force automation package to your company's sales division and PeopleSoft Financials to your accounting group and can integrate the two systems so data flows from one to the other.

ASP services are far more comprehensive than the typical hosting solution. This is why there is an intense focus on network architecture and high-availability data centers. Clients must be able to access highly sensitive data over public data networks with performance that approaches the operation of their LANs. To support this requirement, an ASP's network must maximize performance between the client and host application, deliver encryption and private networking to protect corporate data, and incorporate extensive redundancy in the network and hosting server facilities to guarantee a robust, fault-tolerant environment. The data centers should feature top network and server hardware, and each client should operate on a dedicated server platform with failover redundancy, continuous server monitoring and performance tuning. Total ownership of the data centers is critical to an ASP's goals of security and reliability.

Because an ASP controls every aspect of the service, it can offer high service-level agreements (SLA). For example, USi offers SLAs up to 99.9%. These SLAs cover availability, functionality and performance from the applications to the network.

Bottom line, the fact that a true ASP will assume total responsibility for your operation and assure you that the functionality works 24-7 is the main reason you should choose a third-party ASP rather than lease an application from a vendor.

McKnight is executive vice president of operations and CLIENT services for USinternetworking, an application service provider in Annapolis, Md. He can be reached at jlm@usi.net.

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ASP ADVICE

Once you've chosen an application service provider, here's what you need to do to keep things on track.

BY LAUREN GIBBONS PAUL

The idea of using an application service provider (ASP) is certainly appealing, but don't think you can just kick back and relax while someone else handles the job of running your company's applications.

"There is an out-of-sight, out-of-mind tendency [in ASP customers]," says Lew Hollerbach, senior analyst with the ASP practice of Aberdeen Group, a Boston market research firm.

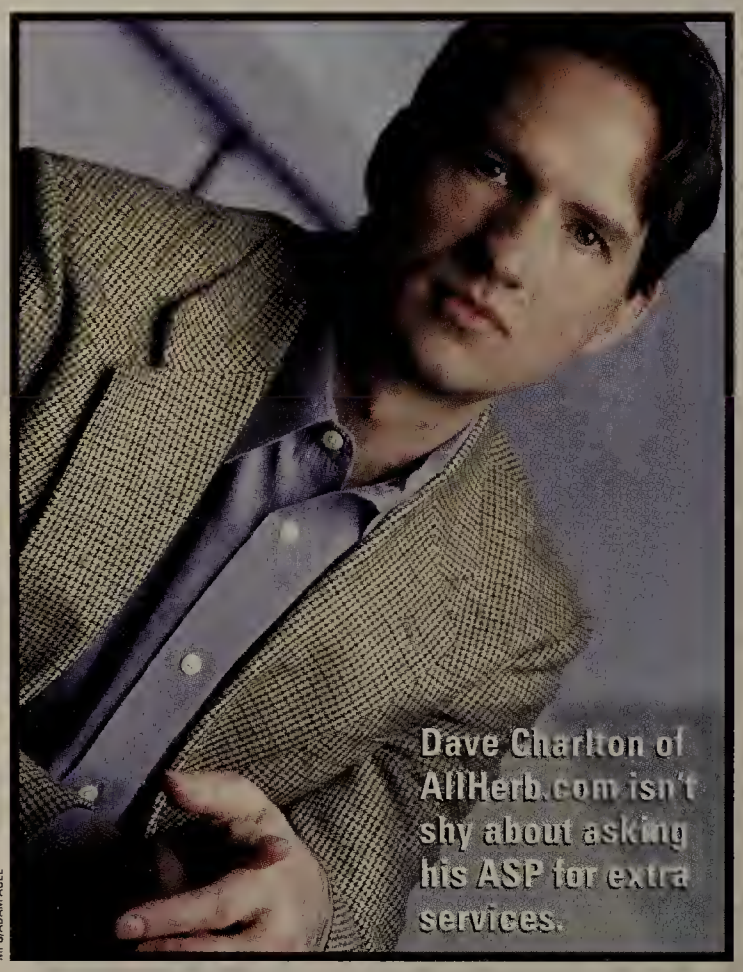
The truth is, you must manage your ASP just as you would your in-house staff. After all, an ASP is an extension of the IT department. If anything, the management challenges are greater because the ASP will not be located within the four walls of your organization.

Once you decide to cede control of your corporate applications, the following tips from some of the first network executives to use ASPs will come in handy.

• **Choose wisely.** To prevent headaches down the line, use great care in selecting your ASP. David Blumhorst, director of IT at Clarent in Redwood City, Calif., says that price should not be paramount in picking an ASP. "You have to look for the expertise, check references, visit their site, meet the people," says Blumhorst, who rents the PeopleSoft enterprise resource planning (ERP) application from Corio.

Remember, when you're buying a service, you're buying people, says Jonathan Lee, founder and chief strategy officer at Corio, also in Redwood City, Calif. So make sure you have a single point of contact for the ASP, and make sure you like that person.

• **Have a backup plan.** Before you sign on the dotted line, make sure you scope out an exit plan if your ASP has performance problems or even goes out of business. Curtis Dudnick, chief financial officer and secretary of CoSine Communications, a maker of IP telephony equipment in Redwood City, Calif., had risk management principles in mind when he crafted his firm's contract with the ASP Applicast. Dudnick made sure there was a provision for CoSine to take over the contract with Applicast's data center provider, GTE, if necessary. Dudnick also arranged to have ownership of the application software automatically transferred to CoSine if Applicast failed. "With any ASP, there's not a lot of history. It was a new, unproven area. But the model was so appealing, I was willing to try it," he says. So far, so good, he adds. Applicast has met its service levels, and Dudnick is pleased with his decision.



MPG/ADAM AUEL

Dave Charlton of AllHerb.com isn't shy about asking his ASP for extra services.

• **Keep the communication flowing.** As much as you might want to concentrate on your own job and put the ASP relationship on the back burner, don't do it. Check in with your ASP contact at least once a week by phone. "We have weekly reviews of how the application is performing," says Ed Hayes, vice president of corporate development at Flash Electronics, a contract electronics manufacturer and ASP customer in Fremont, Calif.

If your contact isn't responsive, demand a new one. At this early stage in ASP adoption, the company will probably do whatever it takes to keep its customers happy.

• **Don't take service levels for granted.** "You shouldn't take their claims at face value. Trust, but verify," Aberdeen's Hollerbach says. When you're renting a high-stakes application such as ERP, you should invest in your own performance monitoring tools. "Service-level agreements are very hard to measure and enforce in the absence of a tool kit. That's one of the dirty little secrets of the ASP industry," says Greg Kee, vice president of marketing at Xevo in Marlborough, Mass. Xevo sells service management platforms to the ASP industry.

• **Insist on extra services.** With what seems like hundreds of new companies calling themselves ASPs every week, it pays to remember that just hosting an application does not an ASP make. Many ASPs offer value-added services at no extra charge. For example, Dave Charlton, chief operating officer and chief information officer at the herbal product company AllHerb.com in Laurel, Md., got free marketing advice from his ASP, Pandesic. "They can tell us about things that have worked for their other clients. They share marketing knowledge — it's like being part of a coop," Charlton says. Because Pandesic is paid based on its customers' site volume, it has good reason to want them to succeed.

• **Make sure there's flexibility.** ASP contracts are much more flexible than the multiyear, monolithic contracts with traditional outsourcers. If at any time you feel your pricing arrangement has become less than ideal, don't be afraid to speak up. "Contracts must reflect the appropriateness of the business deal. Our customers need to renegotiate pricing all the time," Corio's Lee says. "We focus on rapidly growing companies that are living on Internet time. Change is a constant."

Paul is a freelance writer in Waban, Mass. She can be reached at laurenpaul@mediaone.net.

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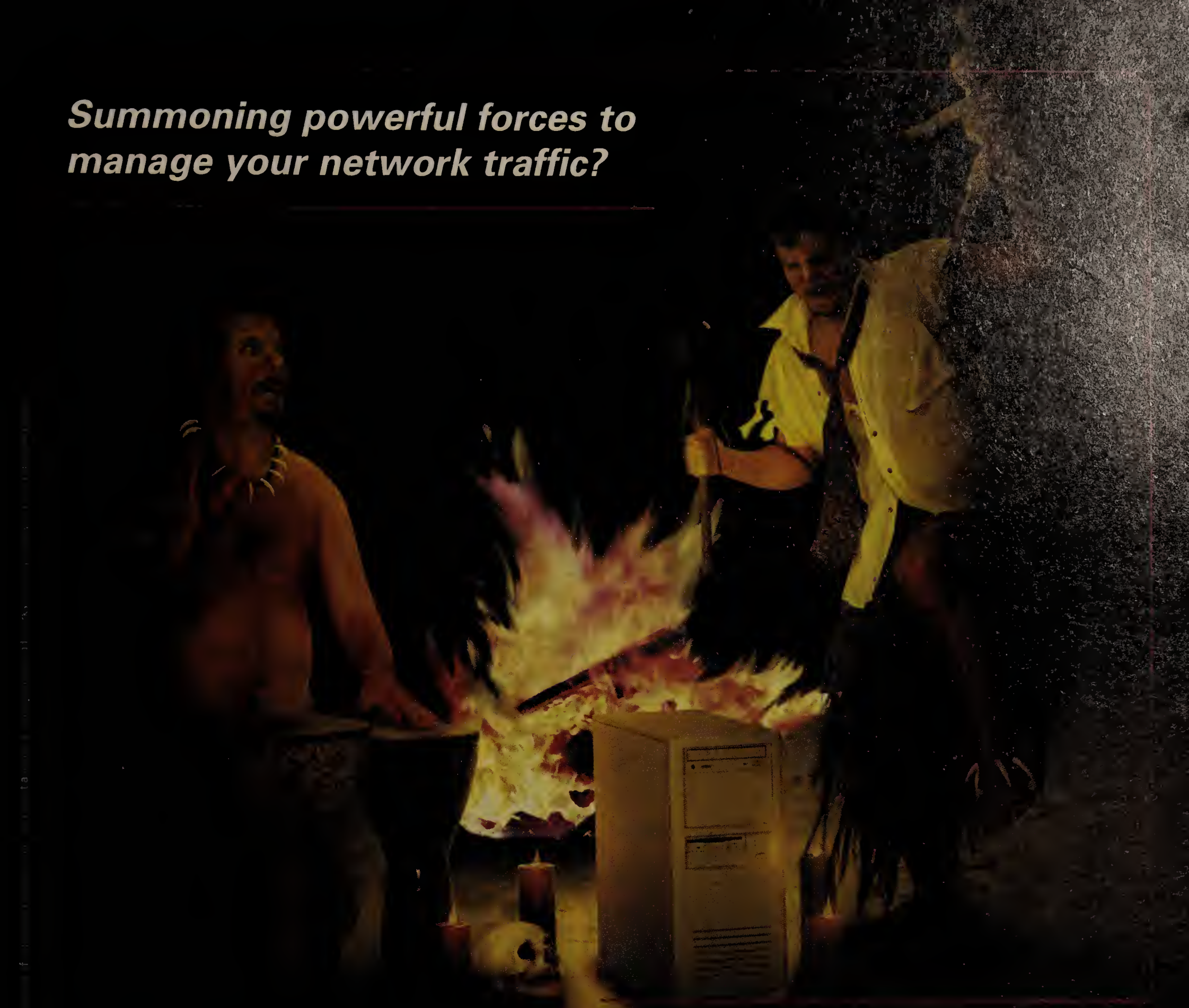

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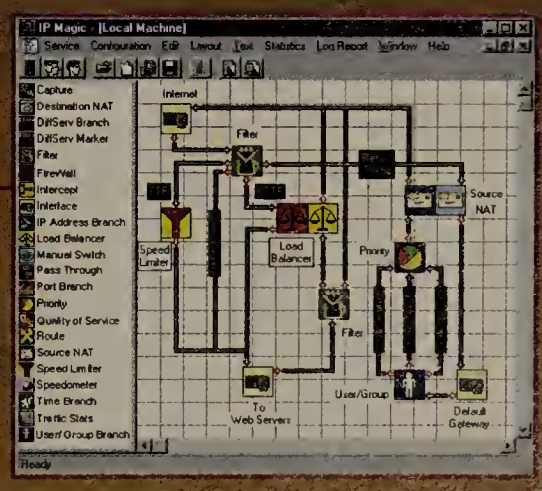

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Faster phone line networks

I've written before about my frustrations getting my home computers networked. I tried power line networking, phone line networking and wireless. The problem was that while connectivity improved over sneakernet, the speed was more like orthopedic shoes.

That's all about to change for wired and wireless connections. I tried D-Link Systems' DHN-910 Home Phoneline Network, and I'm happy to report that home networks are now up to speed.

Ethernet speed, that is. D-Link promises 10M bit/sec throughput. I actually got more than 11M bit/sec doing an FTP file transfer of a 4M-byte file using Ipswitch's WS_FTP Pro application. The file, a snapshot of a system.dat file, was probably fairly compressible, accounting for the better-than-expected throughput.

I've been surprised by products' performance before, but it's generally not such a happy surprise.

The DHN-910 package includes two PCI adapters, two phone cables and software. The adapters comply with the new HomePNA 2.0 standard for 10M bit/sec throughput, released in December. As such, they should interoperate with other vendors' adapters, as well as 1M bit/sec HomePNA 1.0 hardware. D-Link's was the first of these products I've seen; since I didn't have any others to test, I'll reserve judgment on interoperability.

The software is called MidPoint Lite, a stripped-down proxy server from MidCore Software. Run the proxy software on your Gateway computer, and it acts as a Dynamic Host Configuration Protocol server for your internal clients. It could hardly be simpler, which is just what you want in a product used mostly in homes. There's also a CD-ROM with a couple of shareware network games.

The only drawback I found was a slight performance hit on the Gateway system, a 450-MHz Pentium III connected to the Internet via cable modem, as Internet requests now had to pass through the proxy server. But the added delay was generally only a second or so, and I can live with that.

I got to know one of D-Link's technical support crew pretty well when one of my adapters died. She expertly walked me through many steps to try to get it working again before she told me to check the LEDs on the adapter. They were dark; it was dead. D-Link quickly sent a replacement that worked just fine. You can buy additional adapters if you have more than two PCs to connect.

Phone line networking isn't the only hardware moving to Ethernet speeds. The new standard for wireless data communications is 11M bit/sec. I'll be taking that for a spin in a few weeks. ◪

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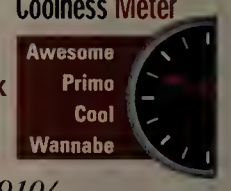

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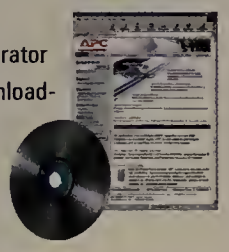

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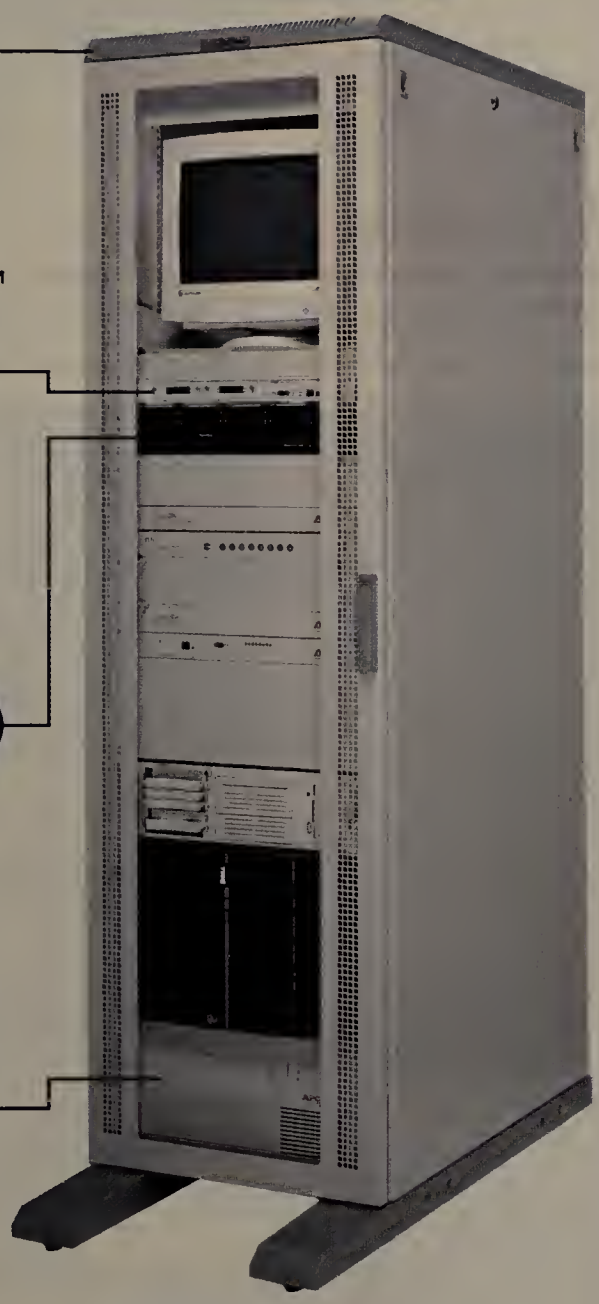

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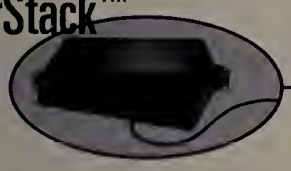

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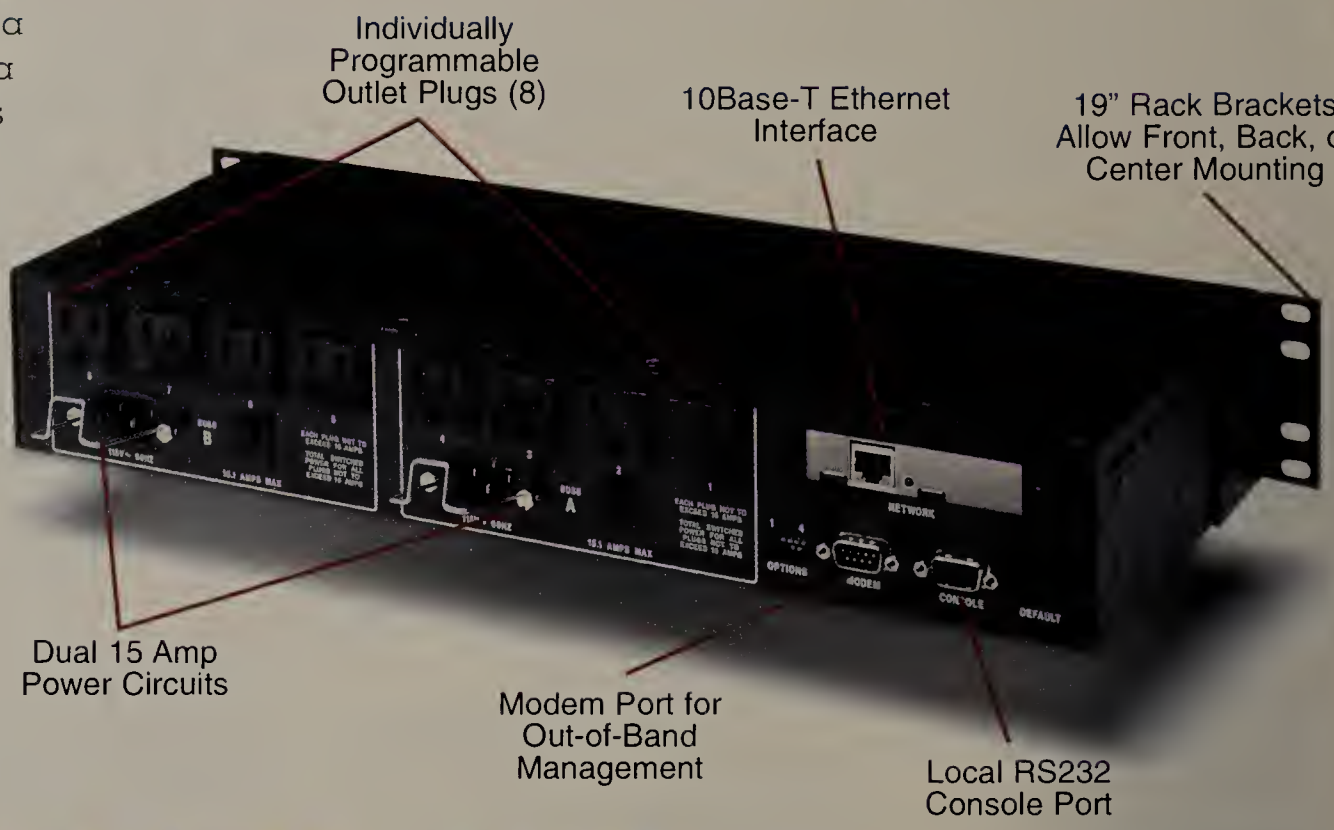

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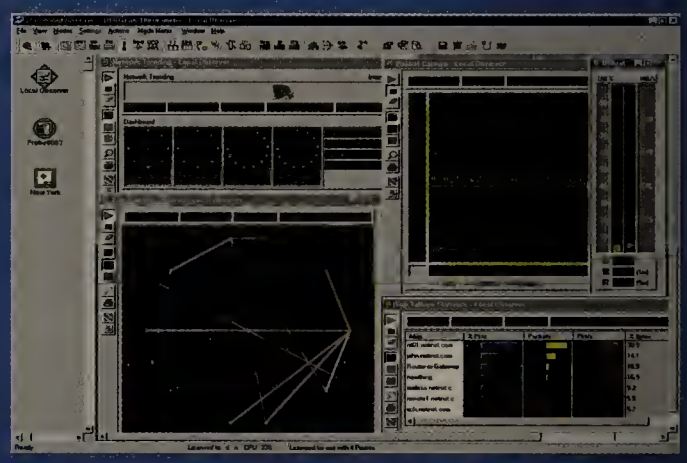

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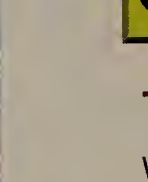

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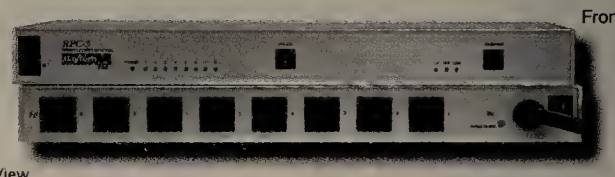

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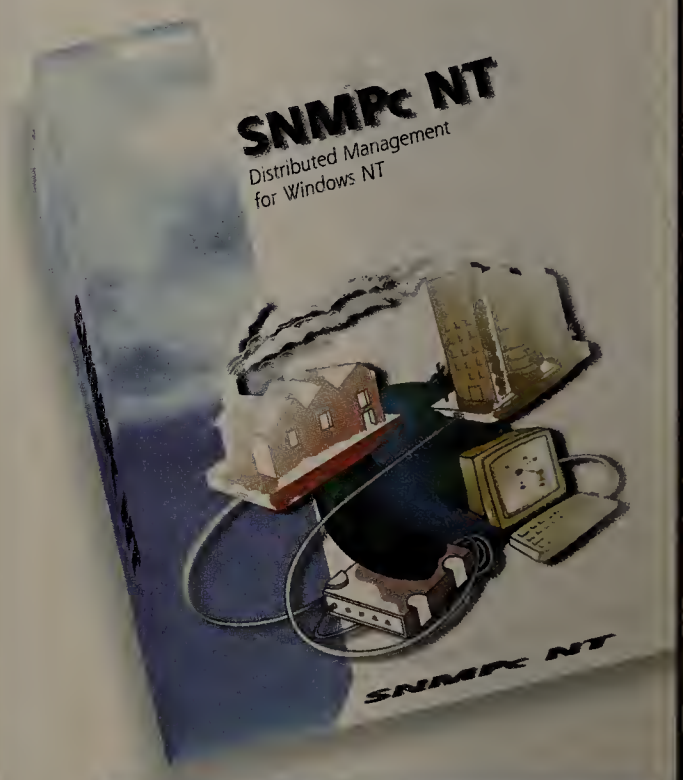

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PeopleSoft Consulting Manager. Job location: Iselin, NJ. Duties: Manage the system set-up and implementation of PeopleSoft financial applications. Analyze existing systems to determine fit with new implementation of PeopleSoft system. Write detailed design specifications and implement applications. Map current financial processes to new processes and develop customizations of software to address identified gaps. Analyze legacy system to interface with new PeopleSoft system. Create, evaluate and manage project budgets and timeframes. Build, lead and manage teams to meet goals and deadlines on budget. Requires: Bach's in Comp. or Info. Sci., Eng., Econ. or related field and 4 yrs. exp. in the job offered or 4 yrs. exp. as a Consultant, Associate or Software Eng. Exp., which may have been obtained concurrently, must incl.: 2 yrs. exp. managing the system set-up and implementation of PeopleSoft financial applications and 2 yrs. exp. developing customizations of software for PeopleSoft applications. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: $105,000/yr. Send resume (no calls) to: Diane Tuccito, AnswerThink Consulting Group, 3200 Windy Hill Rd., Suite 800 West, Atlanta, GA 30339. Must have legal auth. to work in U.S.

Programmer Analyst

Wilton, CT; Analyze, design and develop software applications using Oracle, Cobol, Basic and C++ on Windows NT. Provide technical support. Req'd. 2 years exp. in job offered. 40 hrs/wk. 9:00am-6pm, Mon-Fri. Send resumes to Matrix Information Technologies, 15 Lambert Common, Wilton, CT 06897. Attn: Brijinder Singh.

Systems Analyst/Programmer

wanted by Firm involved in Machine Import, Sale & Servicing; Component. Must have Bach in Mechanical Engg, Electrical Engg, Comp Sci or MIS & 2 yrs s/ware exp. Respond to: HR Dept, Saelio, Inc., 630 Route 303, Blauvelt, NY 10913.

Software Engineer: Analyze, design and develop telecommunication based applications using object oriented analysis and design methods (UML). Develop intra platform applications using CQRBA. Develop and maintain software using C/C++, VC++, Qracle, STL, RogueWave h++ tools, OCI library on HP, DEC, SUN and Windows platforms. Req. Master's in CS, EE, or other related discipline plus one yr exp. in job described. Resume to: Dilip Tunki, SoftTech, Inc., 8282 Western Way Circle, Ste. 1110, Jacksonvill, FL 32256.

Full-time Network Analyst

to design, develop and manage Lotus Notes Databases using LotusScript for various office automation activities. Plan and analyze business processes and write design specifications. Prepare workflow prototype and pilot test the design. Implement and roll out Notes applications. Perform administration of network of Lotus Notes, servers and clients. Install and configure servers and maintain security of network, servers and databases. Provide technical support and training to Lotus Notes users. Upgrade database design to latest design features, and upgrade clients to new releases of Lotus Notes. Provide MIS operation support. Maintain MINX software under the UNIX environment. Perform administration of network of Windows NT and Netware servers. Plan for network growth, network hardware and maintain connectivity of network hubs, gateways, routers and ethernet switches on TCP/IP protocol. Must have a Bachelor's Degree in Computer Science/Engineering or foreign degree equivalent and two years of experience in the job offered or two years of experience as a Network Administrator/Engineer with same duties. 40 hrs/week. Salary $61,381/yr. Apply in person or send two resumes to: Georgia Department of Labor, Job Order #GA6464682, 1535 Atkinson Rd., Lawrenceville, GA 30043-5601 or the nearest Department of Labor Field Service Office.

Software Designer

needed for internet-based appl. dev, s/ware analysis/dsgn/dev using Rational Rose, Java, Swing, XML, HTML, Corba, Oracle, Informix, JavaScript, VB, C++, Perl. Apply to: Global Consulting, 601 Jefferson Rd, Parsippany, NJ 07056.

Development Team Lead

needed to customize business applications in C, UNIX, Forte and PowerBuilder. Apply to: HR, EXE Technologies, 300 Baldwin Tower Blvd, Eddystone, PA 19022.

SOFTWARE ENGINEER:

Design and Development of Business/Commercial application systems in a Unix environment. Demonstrated ability in Powerbuilder 4.0/3.0; Demonstrated ability in Sybase 10; Demonstrated ability in using casetools. Requires: B.S. in Comp-Sci., Math, Engg or related field plus 2 years experience in job offered or in software development. 40 hrs/wk, 8:00 a.m. to 5:00 p.m.; $65,000/yr. Send two (2) copies of resume/respond to: Case # 19983088, PO Box 8968, Boston, MA 02114

Software Sales Consultant

(Marietta, GA) Responsible for computer and ERP/Business management software sales. Duties include configuration of hardware, software and networks. Involved in project management, including writing project reports and documentation for new or modified software and hardware. Will utilize sales knowledge of HP, IBM, COMPAQ PC's and servers. Will present and demonstrate ERP software to clients. Must have 3 years experience in job offered or 3 years in position involving ERP software implementation and project management. Salary $42,000/ year. Must have proof of legal authority to work in the U.S. Submit resume to: Human Resources Mgr - Ad #1, 2160 Kingston Court, Suite D,Marietta, Georgia 30067.

Senior Software Engineer and Speech Software Engineer

Lernout & Hauspie Speech Products, USA, a leading speech technology company worldwide has openings for the above positions. The Senior Software Engineer will work on the development of client/server machine translation software and design & implement new TCP/IP socket interfaces. Must have a Bach's in Comp. Sci., EE or related field & 3 yrs. exper. developing commercial software. The Speech Software Engineer will develop speech recognition software & analyze improved or new speech recognition algorithms & incorporate new technology in the existing code base. Must have a Bach.'s in Comp. Sci., EE or related field & 5 yrs. develop. software in C/C++, incl. exper. implementing high performance/computationally intensive algorithms, object-oriented methodology & speech recognition software. Send resume to Deborah A. Guardino, Sr. Director of Human Resources, Lernout & Hauspie Speech Products, USA, 52 Third Ave., Burlington, MA 01803.

PROGRAMMER ANALYST

sought by Computer Services Firm in Whippany, NJ. Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp planning, dvlpg, testing & documenting comp s/ware using Lotus Notes, Lotus Script & Domino in Win envrmt & dvlpt of Intranet/Internet applics using Java & Java Script. Respond to: HR Dept, Acumen Consulting, Inc., 622 Route 10, Unit 22A, Whippany, NJ 07981

Manager, Software Development sought in Shelton, CT office of company that designs & manufactures PDM software. Guide & administer day-to-day activities of a team of s/w developers. Administer bugs introduced by team's efforts including assignment & tracking. Position requires a Master's degree or equiv. in computer-related field & experience in software dvlpmnt using C & object-oriented programming. Resumes to: Alison Kiefer, Human Resources, MatrixQne, Inc. Two Executive Drive, Chelmsford, MA 01824.

Team Leader

wanted by New Jersey based IS/IT Professional Consulting Services Firm for job locs throughout US. Must have Masters or equiv (Bach + 5 yrs exp) in Comp Sci, Engg or Math & some s/ware exp. Respond to: HR Dept, Caliber Advanced Tech. Inc., 1011 Thayer Ave, Avenel, NJ 07001-2013. (Ref. 99-6126IM).

Systems Analyst/ Administrator

with Novell/NT exposure wanted by Mgmt Consulting & Placement Firm in Princeton, NJ. Must have Bach in Comp Science/Bus Admin & 2 yrs s/ ware dev./admin. exp. Respond to: HR Dept, Performance Development Corporation, 707 Alexander Rd, Ste #208, Princeton, NJ 08540.

Senior Data base Design Analyst- Produce statistical tables, report listings and graphs appearing in FDA submissions. Design, create, validate and maintain clinical databases. Develop interactive applications for use for data management as well as report generation and statistical analysis. Produce documentation of project programs and databases. Supervising responsibilities as needed. Plan and coordinate activities of multiple programmers working in a project. Requirements include a Masters Degree in Biostatistics or Computer Engineering with three years experience in job offered or related field of statistical programming and database design. Strong background in statistical analysis and modeling. Thorough knowledge of statistical analysis software (SAS/BASE, STAT and GRAPH). Applicants must have unrestricted authorization to work in the United States. Salary $58,650/year. 40 hours/wk. Respond with two copies of resume to Case#19983078, P.O. Box 8968, Boston, MA 02114

MatrixQne Inc. has positions available in its Chelmsford, MA office.

Field Service Engineers and Software Quality Engineers, various levels. Positions require a Bachelors or Masters degree in related field, depending upon level. Some require industry experience.

Regional Director of Professional Services. Will perform implementation deployment, and project management of PDM systems in large production environments. Responsible for management of PDM consultants, budget and revenue for the PS eastern region, generation and tracking of project plans, and writing project proposal reports. Requirements include a Bachelors degree or equiv. in CS and experience in project management. If interested and qualified, please submit resumes to:
Alison Kiefer,
Human Resources Representative,
MatrixQne, Inc. Two Executive Drive, Chelmsford, MA 01824.

Programmer Analyst

sought by Software Consulting & Dvlpt Firm in Brighton, MA. Must have BS or equiv in Com Sci, Math or related Engg field & 2 yrs s/ware exp. Respond to: HR Dept, Diligent Systems, Inc., 60 Leo M. Birmingham Parkway, Ste 111, Brighton, MA 02135

Manager, Technical Project wanted by Freight Delivery Co. in Newark, NJ. Must have 4 yrs exp analyzing user reqmts, procedures & problems to dsgn, dvlp, enhance & modify applics within client-server envrmt & dsgng applics using Visual Basic, SQL, Server, MS Access, Crystal Reports. Respond to: HR Dept, Guaranteed Overnight Delivery, 888 Doremus Ave, Newark, NJ 07114

Systems Engineer, Wakefield, MA: Analyze, design, implement & maintain LAN's & WAN's using Novell NetWare, MS-Exchange Server, Xyplex Routers, AIX & 3CQM- Hubs. Implement and Maintain Client Workstations with Windows NT/ SQL / Server/ Windows 95. Provide technical support. Req'd. Bachelors in Engg. or Comp. Scie. 2 years exp in job offered. 40 hrs/wk, 9:00am-6:00pm, $57,000/yr. Submit two (2) copies of resume in response to: Case #19983179, PO Box 8968, Boston, MA 02114.

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Waubonsee Community College is seeking candidates for a full-time tenure track faculty appointment beginning August 23, 2000 for INFORMATION SYSTEMS/MICROCOMPUTERS. Bachelor's Degree in Management Information Systems, Computer Science or related field required; Master's Degree preferred. Concentration in microcomputer systems, Internet and object-oriented programming desirable. Two years teaching experience, preferably at the community college or university level, and/or equivalent applied information systems experience required. Programming or microcomputer/Internet experience required.

Waubonsee Community College is a fully-accredited community college with a headcount enrollment of 10,000. The college is located 40 miles west of Chicago in one of the fastest growing collar counties on a beautiful 243-acre campus with state-of-the-art facilities and technologies. Waubonsee provides outstanding service to its students and district residents through demonstration of its core values — quality, service, value, innovation and accessibility.

Review of applications will begin March 1, 2000 and applications will be accepted until the position is filled. To maximize the opportunity for selection, the following information should be forwarded to the Office of Human Resources as quickly as possible: Letter of interest, resume and college application form. Call, write or visit our website to request an application packet.

(630) 466-7900, Ext. 2914
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National Instruments Corp is a fast growing Hi-tech Co based in Austin, TX & is currently seeking to fill multiple positions in the following:

Software Engineer
Research, dsgn & dvlp s/ware in mainly C/C++ using OO dsgn & s/ware dsgn principles. Must have Bachelors in Engg, or Comp Sci, or Physics or Math. CODE: ZSW

Software Applications Engineer
Develop software applications for products, systems and new business opportunities. Provide technical support for software products and their applications to customers, sales engineers, and distributors. Resolve technical issues using an understanding of electronics and software programming fundamentals. Must have Bachelors in Engineering or Computer Science or Physics or Math. CODE: ZAE

Computer Hardware Design Engineer
Research, dvlp & manage projects in data acquisition, signal conditioning, industrial communication, instrument ctrl, image acquisition, embedded controllers & ASIC prdcts using dsgn techniques in analog & digital circuit dsgn, comp architecture, communication bus interfacing & digital signal processing. Must have Bachelors in Engg, Comp Sci, or Physics or Math. CODE: ZHE

Programmer/Analyst (Business Processes)
Plan, analyze, dsgn, dvlp & test s/ware using Oracle, Lotus Notes, Web; use GUI & object-oriented dsgn to dvlp user interfaces & data entry screens that support business functions. Bach in Info Sys or Comp Sci or Business Admin. CODE ZPA

Staff Programmer/Analyst
Evaluating applications development projects, leading a team of Programmer analysts/interns; planning, analyzing, dsgng, dvlpng & testing s/ware using Oracle & Lotus Notes; using GUI & object-oriented dsgn to dvlp user interfaces & data entry screens. Bach. needed and 2 years as Programmer/Analyst. CODE: SPA

Send resumes to: HR Dept, National Instruments Corp, 11500 N. MoPac Expwy, Austin, TX 78759.
Job Code must appear on resume.

Full time Senior Consultant

Responsible for the Radio Frequency (RF) design and operation of Digital Cellular Networks. Carry out RF Designs and modeling of cellular networks, including Radio Coverage Predictions, capacity and demographic analysis, morphological studies, market analysis, specification of features and services, signaling and interface requirements, and transmission design and deployment, associated with a cellular network rollout. Assist manufacturers and operators in the preparation and submission of license applications and equipment tenders. Conducting testing and field trials cellular of handsets on behalf of both manufactures and operators using experience with various types of digital cellular technologies and the differences with deploying these technologies from a Radio Planning perspective. Perform cellular network audits for existing operators and new venture capitalists, and prepare written reports as to the financial viability of these investigated networks. Responsible for cellular networks site integration activities including site optimization and network optimization for newly deployed networks, using over-the-air measurements. Must have a Bachelor's degree in Computer Engineering. Electrical Engineering, or Electronic Engineering. Must have ywo years of experience in the job offered or two years of experience in a position with same duties. Salary $80,000/yr. Send resume to: Logica Aldiscon 3535 Travis Street, Suite 110 Dallas, Texas 75204 Attn: Sherri Anding.

Programmer Analyst (multiple positions) for d/base administration for Oracle 7.x d/base; create Oracle d/base; create & modify d/base trigger, stored procedure & function; set up environment for distrusted d/base; conduct system analysis, d/base design application development, s/ware implementation & d/base administration; backup strategies & recovery procedure; create/maintain d/base link & snapshots; performance tuning & application tuning of Oracle d/base; monitor Oracle processes; required to use Oracle RDBMS, SQL*Forms, SQL*ReportWriter, SQL*Plus, C, Unix & FoxPro; Reqs. Bachelor's in Comp. Sci., Computer, Electrical or Electronic Engg., Comp. Info. Systems, Comp. Sci. & Engg. or Math or its foreign educ equiv. plus 2 yrs exp in job offered or 2 yrs related exp as S/ware Engr. or Systems Analyst. Related exp must included system analysis, d/base design, application development, s/ware implementation & d/base administration using Oracle RDBMS, SQL*Forms, SQL*ReportWriter, SQL*Plus, C & Unix; $57,780/yr, 40 hrs/wk, OT as req'd, 8a-5p. Must have proof of legal authority to work permanently in U.S. Send 2 resumes & cover letter (no calls) to Illinois Dept. of Employment Security, 401 S. State St. - 7 North, Chicago, IL 60605, Attn: Arlene Thrower, Ref. #V-IL22008-T "Employer Paid Ad"

Software Engineer

Englewood, CO. Must be willing to relocate as required. Design, develop and document software solutions for SpeakEZ speaker verification products using visual C++, Java and relational database under the client-server architecture; maintain and enhance SpeakEZ software products; evaluate new software technologies and how they apply to new and existing SpeakEZ software products. Develop and maintain the configuration of software systems. Assist in the development of software processes for the SpeakEZ software engineering organization. Work with C, C++, client-server architecture, user interface design and database application. 5 positions available. Req'd: Master's Degree or equivalent in Computer Science or Engineering or related field and 1 year of experience as a computer professional. 40 hours/week-8 a.m. to 5 p.m. $66,999.92 per year. Application by resumes only to: Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number CO4647201.

Software Engineer [multiple openings]: Under close supervision, resolve moderately complex technical problems of computer software systems, specifically RDBMS products and tools, their installation, maintenance, use, and repairs or workarounds. Develop solutions through research, collaboration, or problem replication if necessary. Positions require BS in CS or related field, or foreign equivalent plus 1 year of experience. Experience background must include: 1) C, 2) ODBC (Open Database Connectivity), 3) dynamic SQL, 4) UNIX; 5) Call interface. $48,000 per year. Job site: Colorado Springs, CO. Application is by resume only. Send resume to Colorado Department of Labor and Employment, Employment Programs, Attn: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117, and refer to order number CO4646255.

Web Architect

Provide technical leadership & guidance in architecture of Web-site, e-Commerce & data security; research, evaluate & advise mgmt on new tools & tech; dsgn, dvlp & support Web applics; advise mgmt on business & technical issues related to integration of ERP systems w/Web-based e-Commerce systms; review projects & Web application dsgn work; advise & support dvlprs on component dvlpmt issues. MS in Comp Sci or related field or equiv education & exp + 4yrs in job offd or similar duties under a different job title. Commercial or business exp in: Web-site architecture dsgn; Web-based s/ware dsgn & dvlpmt using Java, HTML, WebSphere & JSP; object oriented dsgn & dvlpmt; working in multi-platforms (UNIX, NT); ERP systms & using major Web & d/base servers. 3yr exp in VB, ASP & ActiveX. Willing to travel 20%. 40hr/wk, $77K/yr. Must have proof of legal auth to work in US. Send resume to IA Workforce Ctr, 215 Keo Way, Des Moines, IA 50309-1727. Ref JO# IA1101003. Employer paid ad.

Software Engineer

(Minneapolis, MN): will take technical lead in design of circuit framework and development of new Megabit features utilizing Smalltalk object oriented programming technology. Specific duties include developing public interface for Megabit provisioning; designing auto service order processor; developing new Magabit features including Network-to-Network interface (NNI) support, RADSL DSLAM subtending, modern pooling and ATM VCC Range; developing ATM cell Relay support in intergrator; providing system mentor including framework tests, UMS simulator design and implementation, circuit notes enhancement, design documentation for service/circuit model; and participating in business transaction design and providing technical support to the Integrator end users. Must have a Bachelor's degree in Comp. Sci. or Elect. Engr., and min. 2yrs. Exp. in offered position. $70,000/yr.; 40hr/wk.; M-F, 8:30am-5:30pm. Apply to: Mr. Jack Bader, NetEffects, Inc. 13171 Olive Blvd., Suite 300, St. Louis, MO 63141

WEB ANIMATOR

Plan & lead design, development & production of computer-graphic animation & website development for commercial/Internet broadcast & publishing; plan, develop & produce 2D & 3D computer graphics, & determine effects & product requirements. Coordinate w/staff, oversee assistants & assure quality. Bachelor's (or equiv.) in Computer/Computing Graphics/Animation/Arts (any discipline including advanced courses in computer 3D modeling/animation & multimedia manipulation), plus 1 year of exp. in job offered or 1 year exp. as a Computer Graphic Animator using standard animation software to produce professional quality animation segments. Industry-leading benefits, including a friendly, casual work environment, paid training, flex time, & tuition reimbursement. Please forward resume, including salary history, to: ASAP Software Express, Dept. HR-CW-2/7, 850 Asbury Drive, Buffalo Grove, IL 60089. Fax: 847-465-1087. EOE/AA Employer by choice. www.asapsoftware.com

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Deployment Engineer, (Broomfield, CO) -Install/modify/upgrade software for clients to ensure company products run in client environments & conform to functional specs & customer requirements. UNIX system & database admin. Using C & C++ languages & database platforms such as Solaris, Tuxedo & HPUX. Min req: BSc or for equiv. in Comp. Sci. or related & 1 yr exp. database admin. 59,600/yr, 40 hrs/wk. Must have proof of legal authority to work in U.S. Apply by resume only to Colorado Department of Labor & Employment, Employment Programs, Attn: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe St., Denver, CO 80202-2117. Refer to Job Order #CO4646941.

Senior Software Engineer

sought by Survey Research Center in Chicago, IL. Must have Bach in Comp Sci & 4 yrs s/ware exp. Respond to: Roger F. Kruse-Admin & HR, National Opinion Research Center, 1155 E, 60th St, Chicago, IL 60637.

SOFTWARE ENGINEER:

Torrance, CA. Calsoft Systems, Inc. specializes in custom applications based on the Microsoft Back Office family of products. Calsoft Systems is currently looking for Software Engineers with experience in Windows NT, SQL Server and Visual C++. Qualified candidates should hold a Bachelor degree in Computer Science, Math or Engineering and have one year of related experience. Send resume to: Calsoft Systems, Inc., Attn: Nem Bajra, 20300 S. Vermont Ave, Ste 110, Torrance, CA 90502.

SCS America – BrightStar Inc. is searching for SAP analysts with the following requirements: SAP experience in HR, FI, CO, AM, PS, SD, MM, WM, PP, QM, SM, Basis or Abap/4. Some positions require 2 years of SAP experience and/or Bachelor's degree. Extensive travel and possible relocation involved. Send resumes to BrightStar Inc. 950 Tower Lane, # 1750, Foster City, CA 94404 or e-mail to: resumes@brightstar.com

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Senior Software Engineer

sought by Automated Securities Trade Execution/Analysis Firm in Culver City, CA. Must have Bach or equiv in Comp Sci, Comp Engg, Math or other related field & 3 yrs exp dsgng, dvlpg, testing & integrating client/server based reporting system utilizing database server back end, a user friendly front end with C++ engines & Perl scripts in the middle. Respond to: Teri Provensal, ITG Inc., 400 Corporate Pointe, Ste 855, Culver City, CA 90230.

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- Tech Support Analyst 2/BBA degree + ABAP/4 & SAP R/3 skills + min 1 yr related exp. Attractive benefits pkage.

Submit resume indicating desired position to HR Mgr, CIM Vision 300 Oceangate, #1500, Long Beach, CA. 90802

Software Engineer

sought by Automated Securities Trade Execution/Analysis Firm in Culver City, CA. Must have Bach or equiv in Comp Sci, Engg or related field & 1 yr s/ware exp. Respond to: HR Dept, ITG, Inc., 400 Corporate Pointe, Suite 855, Culver City, CA 90230.

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- 2 years of JavaScript, SQL databases (ORACLE preferred), C++, and OLTP. 1 year of Java, EJB, and CORBA experience.

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Programmer/Analyst wanted by New Jersey based Software Dvlpt Firm for job loc throughout US. Must have Bach in Engg, Science, Comp or related field & 1 yr exp dsgng comp applics for business systems using Oracle Developer/2000 relational database engine. Respond to: HR Dept, International Systems Technologies, Inc., 1812 Front St, Scotch Plains, NJ 07076.

Sr Programmer/Analyst
U.S. Bankruptcy Court/Miami
$41-$67K ANNUALLY

Min 3 yrs exp of comp. programming & sys. analysis & design. Exp in C/C++, Unix Shell, Perl 5, Unix RDBMS & MS-Windows based develop. tools a must. Internet web page programming exp and BS degree in Comp. Sci. or MIS desired. Exc benefits. For appl. call 305-536-5216x 3028. Submit appl. to: U.S. Bankruptcy Court, Human Resources, 51 SW 1 Ave #1517, Mia, FL 33130 or fax to 305-536-4122. JOBLINE: 305-536-5216 (Press 8)

Position for Technical Support Analyst

Denver Metro Area. Under close supervision and monitoring, to design and develop system using Visual Basic and C++ as front end programming language and SQL Server as database for processing information for law firm practicing in areas of international trade law and immigration law. Manage database and maintain system/software using C/C++ scripts and stored procedures. Evaluate data load and the capacity of computer system and make recommendations for efficiently using the computer system. Evaluate user request for new or modified programs, consult with users to identify and clarify program objectives. Provide users with basic operating system instructions, on-going support, and training. Troubleshoot hardware and software problems. Must have a Bachelor's Degree in Computer Science or related field. 40 hrs./wk, M-F, 8:00 a.m. to 5:00 p.m., $32,000/yr. Apply by resume to: Colo. Dept. of Labor and Employment, Employment Programs, ATTN.: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe St., Denver, CO. 80202-2117, and refer to order No. CO46446679.

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Monday, February 28	Tuesday, March 7	Wednesday, March 22	Tuesday, April 25
Philadelphia Marriott	Hyatt Regency Dearborn	Dallas Convention Center	Navy Pier
PHOENIX, AZ	**ST. LOUIS, MO**	**NEW YORK**	**LONG BEACH, CA**
Monday, February 28	Monday, March 13	Tuesday, April 18	Tuesday, May 9
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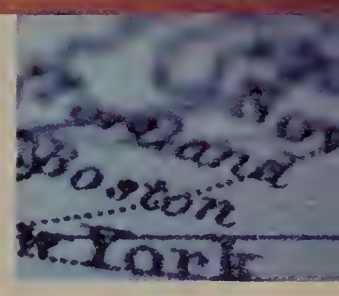

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IT'S ALL ABOUT eBUSINESS

Ford,
continued from page 1

inal monthly fee.

Ford's Internet access program — the largest deal of its kind — is being hailed as a sign of how the Net is reshaping the way American companies do business. Experts expect other automotive and manufacturing companies to follow suit.

"It's going to be very difficult for the other car companies not to grant their employees the same kind of deal," says Rob Enderle, vice president of desktop and mobile technology at Giga Information Group in Santa Clara, Calif. "It's hard to believe that other largely unionized industries aren't going to get pressure to offer this kind of benefit."

In fact, Delta Airlines announced Friday it is offering a similar program to its 72,000 employees. Delta's goal is to improve communications with mobile workers, many of whom do not have corporate desktop systems. The home PCs under the Delta plan come equipped with a link into DeltaNet, the company's intranet.

Deals of this magnitude are made possible by the plummeting costs of computer hardware, software and Internet access, says Steven Clemons, senior vice president of the New America Foundation, a Washington, D.C., think tank that tracks Internet access issues.

"Ford and the [United Auto Workers] are punching a hole in the connectivity problem for the people they work with," Clemons says. "I see all of the trends moving very quickly, to the point where everyone will have Internet access at work, at home and at the community center."

Ford's three-year Internet access program is the latest in a series of e-business announcements from America's No. 2 car maker. Ford recently announced deals with Oracle, Microsoft CarPoint, TeleTech, Yahoo, Bolt.com, iVillage.com and UPS Logistics Group.

"Ford is recasting itself as not an old smokestack, steel and rubber-tire type of company, but as a more modern, IT-friendly company," Clemons says. "It's very clear that it's a top-down strategy."

Ford officials say they are subsidizing Internet access for their employees to ensure that the workforce is technically savvy and to provide a new channel of interactive communication for employees.

"The automotive industry is at the bleeding edge of technology," Ford CEO Jac Nasser says. "In product development, customer satisfaction, customer service and in the manufacturing plant — everything is touched by technology. We want our employees to experience what's going on in technology."

The Ford program is being coordinated by PeoplePC, a San Francisco start-up that offers PCs, printers and unlimited Internet access for $25 per month to members who agree to receive e-mail pitches from companies that help underwrite the costs of the service.

In the U.S., Ford employees will have a $5 monthly co-payment for the subscription service. Ford employees have the option of upgrading the PC, printer and Internet access at an additional cost.

"Ford employees should be dancing in the streets," Enderle says. "These are extremely reliable systems that won't break. It's more technology than the average user could ever have wished for."

PeoplePC officials expect to begin shipping systems in April, with service availability around the world within 12 months. The program is set to last three years, after which the employees own the systems.

Ford officials declined to comment on the cost of the program, but estimates ranged as high as $200 million. Enderle argues that Ford will actually save money by improving the computer literacy of its employees and by cutting down on other telecommuting expenditures, such as laptops.

"When Ford considers the productivity benefit they're going to get out of this program, they may end up being ahead moneywise even after the subsidy," Enderle says.

Delta also is coordinating its program through PeoplePC at a copayment of $12 per month. Delta has yet to pick a hardware supplier, but Internet access will be provided by AT&T. ◪

From the assembly line to online

Ford plans to connect its workers' homes to the Internet at a cost of $5 per month to each participating employee. The equipment and services included in the program:

- A Hewlett-Packard Pavilion PC and DeskJet printer.
- Unlimited Internet access via UUNET.
- Customized portal that will feature links to Ford information.
- Two e-mail addresses per system.
- 10M bytes of storage space on the Interliant service to host a Web site.
- Three-year warranty, round-the-clock phone support and in-home service.

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PC POWER TO THE PEOPLE

Webcast: View the announcement from Ford.

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find it online

Schmidt,
continued from page 16

But how will Novell rise above all the noise created by the many other companies targeting e-commerce?

There aren't any companies that aren't going after the e-commerce market. But we have the only working cross-platform directory. In the security area, we are the only company that has a directory that can manage all the certificates a company may need. *[Editor's note: Schmidt also says Novell plans to add a product to its ZENworks line focused on e-commerce.]*

STAN BAROUH

Novell recently bought a company called JustOn to get into the online storage services market. What other areas will Novell focus on this year through acquisitions?

We're going to buy a whole lot of little companies to fill out our technology map in the directory, management and security space.

Can Novell remain independent for the next five years?

Sure. Is there some reason to think we couldn't? Novell is the fifth-largest software company in the world, revenue is growing, we're making a lot of cash, morale is good and customers are happy. ◪

Qwest,
continued from page 6

One user based in the Northeast who asked not to be identified says that at one point he kept losing connectivity with three of his frame relay sites for "five to 20 minutes out of every hour." He says that several days into the incident, Qwest representatives told him to stop reporting trouble because the company had opened a master ticket for all complaints they were receiving. "They told us not to call anymore when it happened because there was nothing they could do for us," the user says.

The incident began Jan. 18 when Qwest engineers isolated several reported failures of frame PVCs to an OC-12 link between Atlanta and Fort Worth, Texas, says Qwest spokesman Tyler Gronbach. Because the traffic was not being rerouted properly, the carrier added the three additional OC-12 links. Then Qwest noticed an unusual number of errors coming from the Los Angeles switch, again relating to attempts to move traffic to alternate routes.

It was unclear last week whether the problem in that switch was triggered by the network slowdown in the East or was coincidental.

Gronbach conceded that Qwest had been due to upgrade to faster processor units for all of its Lucent switches later in the year. Analysts took that cue to absolve Lucent of any direct blame for the incident, instead noting that Qwest is probably forced to install so many new switches to meet its high growth rate (see graphic, page 6).

Many of Qwest's frame/ATM switches have been using older versions of Lucent's hardware and software, and such problems can happen to any carrier "whenever they are having to roll out the switches so quickly," says Steven Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C.

Other analysts had a harsher reaction, charging that Qwest continues to sell more services than its network rollout and back-office support can handle. "If there was ever an award for marketing, it would have to go to Qwest," says Bob Morrison, president of Morrison Group, a telecom user consultancy in Thousand Oaks, Calif. "But they should also get the biggest loser award for not looking ahead to all the capacity they're going to need."

Southern California remains a hotbed of Qwest problems, he charges, citing one recent T-1 order that took up to 120 days to provision and another that has not even received an installation date after 30 days.

In any case, last month's frame and ATM problems were not limited to these areas. For example, one user cites dropped circuits for sites in Oregon, South Dakota, West Virginia and Ohio. Qwest last week declined to state how many frame relay switches it has, citing competitive concerns.

A Lucent spokeswoman declined comment other than to say that the switches and processing units involved are "the same hardware that is used in many of the world's largest service-provider networks." Qwest's Gronbach says the company will honor the terms of its frame relay service-level agreement, conceding that a number of users' guarantees for network availability and latency were broken by the incident. ◪

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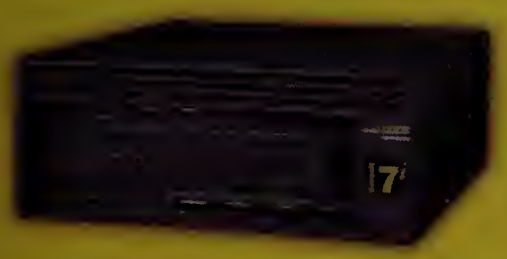

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Linux,
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Miller was asked why his company chose to use a proprietary model for its clustering software.

"There's been some misunderstanding as to how we've been developing and what our intentions are for our TurboCluster Server product," he said, noting that the company's plan is to release closed portions of its software to the open source community six months after such software is released commercially. "This model, we believe, is a good compromise, and it also allows us to be a viable business with a six-month edge — that's not a long time."

Robert Bruce, CEO of Walnut Creek, which sells FreeBSD and Linux, was ribbed about why the Jacob Javits Center was hosting LinuxWorld rather than FreeBSDWorld last week. Bruce defended his company's dual interests, emphasizing that FreeBSD is another viable alternative to proprietary offerings. Bruce later took VA Linux to task for failing to offer FreeBSD on its hardware in addition to Linux. But VA Linux's Biles wouldn't budge, saying Linux would remain the company's core focus.

Other hot topics were the overcommercialization of Linux, the ability of Linux to overtake more established operating systems, and the need for vendors to remain loyal to the open source model. Asked how his soon-to-go-public company would deal with pleasing investors as well as the open source community, Caldera CEO Ransom Love responded that his company would be a first-rate business software provider, but also remain a committed contributor to the open source community so that everyone's needs, including those of the grandmothers of the world, will continue to be addressed.

MPG/KEN GABRIELSEN

SuSE's Stefan Wintermeyer, VA Linux's Brian Biles, Walnut Creek's Robert Bruce, Caldera's Ransom Love and TurboLinux's Cliff Miller face off at *Network World's* Linux Showdown.

Love also was asked how Linux can survive even as vendors of more-established operating systems start to dabble in the open source area. He said the fact that Linux was developed on the Internet and supports Internet technologies such as IPv6 means that the technology will continue to have an edge when it comes to running Internet applications. Linux will only get better because it "provides that level playing field that allows everybody to collaborate — even major competitors are now able to collaborate when it comes to the Linux platform," Love said.

Love later asked SuSE President Stefan Wintermeyer about his company's support for LSB, a set of common specifications that Linux vendors could agree to support. Wintermeyer was firm that SuSE would do all it could to promote and support LSB. He was a little less sure, however, of what the future might hold given the fast pace of the Linux market.

When asked about what SuSE's big areas of focus would be for the next couple of years, Wintermeyer said he could really only talk about the next six months. During that period, SuSE will attempt to replicate some of its success in the European market in the U.S., he said. ◪

Win 2000,
continued from page 10

risk losing customers.

"We are not totally buying into DNA yet," says Chris Smith, chief information officer of furniture retailer HomeLife, an early adopter of Win 2000. "We use Silverstream Software as our application development platform and XML server."

Microsoft also is using DNA 2000 to woo service providers that need platforms on which to host applications. In the absence of a complete product, Microsoft is throwing around money to win mind share and technical assistance, including a $90 million investment last year in USWeb/CKS, and commitments last month of $50 million to Digex and $10 million to Corio.

If Win 2000 is to be a player in the service provider market, especially for application hosting, Microsoft must re-architect the operating system, observers say.

For example, Win 2000 must give service providers a way to dedicate portions of a server's computing resources to individual customers. Microsoft is trying to address that issue, and last month the company invested $5 million in Interland, a Web-hosting company in Atlanta, to support development of the firm's provisioning technology. The technology lets providers automatically provision space on NT-based servers to more quickly and easily set up Web sites in a shared hosting environment.

Infrastructure security

Microsoft also must create a more centralized, scalable, secure infrastructure that has fewer moving parts, according to Jonathan Lee, chief strategy officer and founder of Corio in Redwood City, Calif.

"Microsoft's whole strategy must cater to those needs," he says.

Microsoft's answer may be its Next Generation Windows Services (NGWS), which new CEO Steve Ballmer announced last month. Microsoft has only said NGWS is an Internet-based platform with a new interface, file system, XML schema, application development model and software-based services. Ballmer said details are coming in April, but already confusion exists over how NGWS relates to DNA 2000.

"Fundamentally, NGWS is Microsoft's vision of server-based computing," says Summit's Davis.

On top of all that, Microsoft also will need to re-engineer its core applications — Exchange and Office — to run in a hosted world, reinvent its licensing model, and completely revamp its relationship with the sales channel.

So after three long years developing Win 2000, the operating system is really just a vehicle for what likely will be a wild ride. ◪

OpenView,
continued from page 14

toward integrating various point packages rather than selling them individually.

"The time of the framework has arrived at last," says Paul Mason, vice president of infrastructure software research at International Data Corp., a market research firm in Framingham, Mass. The frameworks are just being built differently — integrating good point tools together where it makes sense, instead of starting with a framework and plugging in tools. HP will probably move its other existing tools, such as IT Service Management and OmniBack, into the VantagePoint family, Mason says.

By collecting management data through a range of products, HP can provide a business-oriented view, says Magdy Assum, product manager at HP. Instead of looking at individual elements — such as routers and systems — IT managers can see how an outage is affecting a particular business process, such as the "shopping cart" function on an e-commerce site.

Hancock says the business-process view is important for setting priorities. "I may have an opinion of what is mission-critical, and another department may have another idea," he says. If the software can clearly show what problems are damaging the most important business processes, the debate is settled.

Small vendors such as FirstSense and Landmark already offer software that can dynamically adjust how much data is collected from agents, Mason says. But he adds this is the first time a major management player has implemented the capability.

VantagePoint is scheduled to ship in April, starting at $20,000.

HP: www.openview.hp.com

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B2B
continued from page 1

tives had to input purchase data into Weidmuller's enterprise resource planning (ERP) system.

The old style of customer management is giving way to Web-based commerce that lets Weidmuller's distributors buy from an online catalog listing the 10,000 electronic parts the firm sells in the U.S. The catalog is housed in an Oracle database that can be accessed over the Web and searched with the Saqqara StepSearch search engine.

Weidmuller's distributors can now tally purchases online based on prenegotiated, customer-specific prices. And distributors no longer have to call customer service representatives to check the shipping status of orders — that information is now available on the Web.

With its global headquarters in Detmold, Germany, and its U.S. office and warehouse in Virginia, Weidmuller generates about $550 million per year in revenue, one-sixth of it originating in the U.S.

Weidmuller competes against firms including Allan-Bradley, The Rockwell Group and Wage. Many of these firms have had Web-based catalogs up for more than a year, and it is not uncommon for the sites to give Web visitors automated technical comparisons of electronics parts from different vendors. Weidmuller uses CrossWare's cross-reference tool in conjunction with a Microsoft database. Technical staff keeps these comparison spreadsheets up to date.

But among the firm's competitors, Weidmuller is the first to go beyond electronic catalog display and comparison and actually sell products online.

"There are multiple manufacturers making these terminal-block connectors, and the differences get less and less as they become more of a commodity," says Frederik Wenzel, chief financial officer at Weidmuller's U.S. headquarters. "So how do you differentiate yourself? Through customer service — and e-commerce can do that."

Although his CFO title makes him Weidmuller's official bean counter, Wenzel's engineering background has prepared him to understand the nuts and bolts of networking and the Web.

"With e-commerce, we can automate the key-entry function so there are fewer opportunities for error," he notes. "We as a company have to do everything and anything to be ready for e-commerce."

MPG/BOB JONES

Weidmuller's Pollock (left) and Wenzel have teamed to make their company's wiring gadgetry easy to buy online.

More than a year ago, Wenzel got senior management and IT staff behind the idea. Based on the enthusiasm the firm saw in its American division, Weidmuller headquarters in Germany gave the U.S. operation the go-ahead to be the first of its divisions to get into e-commerce. But the project had to be funded out of the U.S. division's profits. And while Wenzel and his IT team won't disclose exact cost figures, they don't argue that e-commerce for them is clearly a million-dollar baby.

It's a gamble Weidmuller believes will pay off down the road in productivity gains. The move is also a step the firm feels it must take to do business with distributors in a new way.

To start, Weidmuller made the decision to use J.D. Edwards' ERP software, running on an IBM AS/400, as the main repository for commerce data.

An alternative would have been duplicating database information for access over the Web, but "that's not real-time," Wenzel says. "We wanted a live interface with the system for the front end to communicate with."

J.D. Edwards' OneWorld software on the AS/400, accessed over Weidmuller's NetWare LAN, stores the terminal-block product and shipment information, and customers' pricing terms, credit limit and buying history. The system gets backed up continuously.

Weidmuller's Web development manager for the project, Anthony Pollock, says the J.D. Edwards manufacturing, logistics and financial software provides the features Weidmuller needs. Plus, the software maker has available scripted code for extending access to the Web.

Weidmuller's e-commerce technical strategy has been to give distributors a controlled view over the Web into the J.D. Edwards back-end system, letting them enter orders and check shipments, but restricting the distributors from seeing information about others.

"We limit what they can see internally," Wenzel says. The gatekeeper role is played by an Ironside Technologies Java-based software server that restricts what the distributor can do after authenticating his identity at the Weidmuller.com site. The gatekeeper also acts like an application server sitting between J.D. Edwards' back-end system and a Microsoft Internet Information Server users access from browsers.

After the distributor proves his identity through encrypted password and identification, Ironside's World Access Server downloads a 24K-byte Java applet to the distributor's Java browser. This applet lets each distributor make use of the sophisticated features of the J.D. Edwards software, such as inventing queries. "Our 200 distributors now have access to this," Pollock says.

Wenzel says when distributors first hear about e-commerce, "they have a heart attack, thinking you're cutting them out of business." While some of Weidmuller's U.S. business already comes from selling directly to big manufacturing customers rather than distributors, the firm is striving to allay the anxieties of the distributors. Weidmuller is focusing its first e-commerce efforts on its distributors, not the big customers that buy wiring components directly.

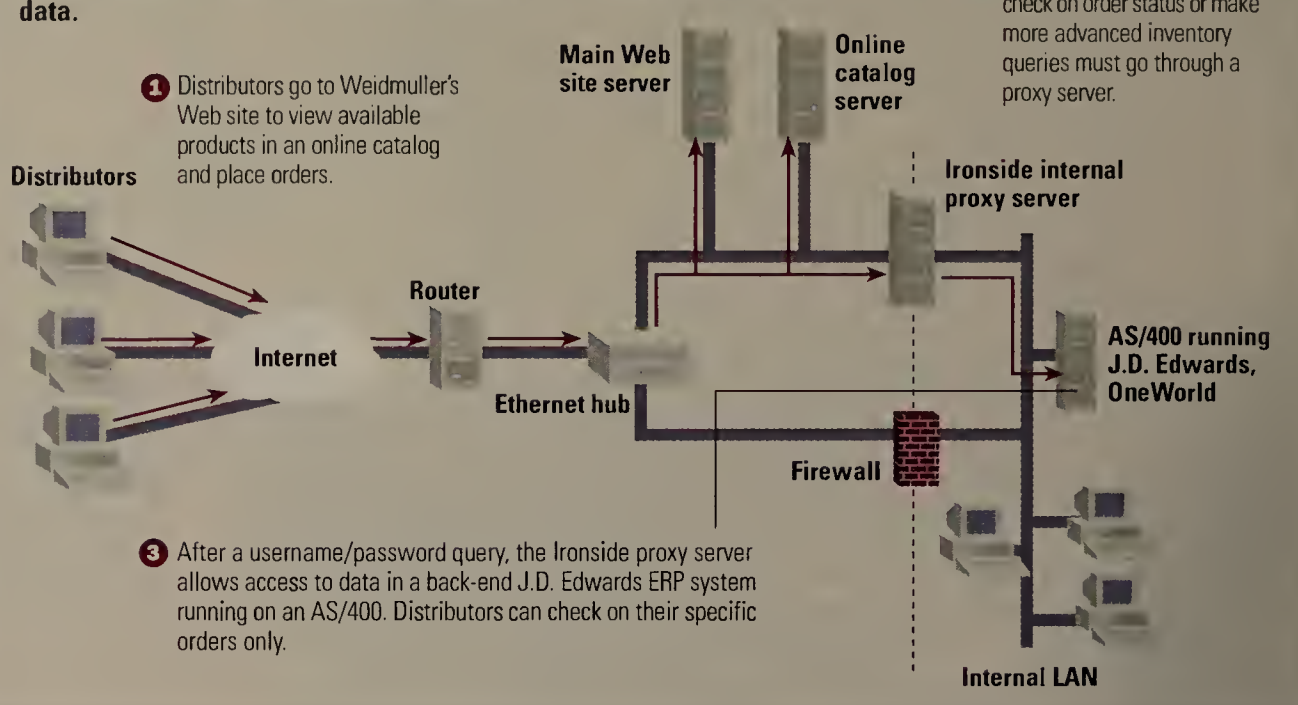
"But the key is to partner with the right distributors," Wenzel says. This means the ones willing to not only do business over the Internet but perhaps go further to automate the supply-chain process.

Wenzel is so convinced online commerce will make the process more efficient that the manufacturer is offering a 2% rebate on all orders placed at Weidmuller's Web site this year.

He seems to have no illusions about all sales moving to an e-commerce model over-night. "But we're ready to favor distributors doing e-commerce," Wenzel says. ◪

Keep distributors in the loop

Weidmuller is letting distributors place and check the status of orders via the Web — without compromising the firm's internal network and data.



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Backspin

Technology with emotion

"I've learned not to put things in my mouth that are bad for me."

— Jenny Craig spokeswoman Monica Lewinsky, on CNN's "Larry King Live" discussing her impressive weight-loss.

MARK GIBBS

Ah, the things we monkeys say without suspecting the consequences. When I discussed the "King of the NOS hill" article in last week's *Network World,* little did I suspect the response the feature was going to attract (more than 400 messages in the forum) or the response my column would get (a heady mixture of applause and abuse).

Actually, the abuse I fielded wasn't over my position that an objective, comparative review of network operating systems is intrinsically impossible and guaranteed to be flawed because of the scale of the task. Oh no, it was because I said the article was a "good solid piece of research."

To all you who wrote in to chastise me — come on, give me a break! I was being uncharacteristically nice and you should all applaud my self-control. And to the one reader who was impressively abusive, I think it is time you increased your medication.

Be that as it may, the letter and forum responses are revealing -- just look at the outpouring of emotion! Some people get really angry over this stuff. There are people canceling subscriptions and accusations of Microsoft mind control. People, people . . . relax!

While you all have good points to make (except for you, Fred Smith), the interesting thing is that there is emotion involved. Lots of it. Anyone who thinks our decisions about technology are cold and objective only has to see this kind of debate to realize the opposite is true.

Yep, we're a passionate bunch. Gad, just try standing up at a Linux event and say something nice about Windows or Microsoft; you might get lynched, if you're lucky. And just try suggesting to a Macintosh fanatic that the Mac ain't what it used to be . . .

So how emotional are you about IT? Take our simple test:

1. **Bill Gates is . . .**
   A. The antichrist.
   B. OK.
   C: Who?
2. **What do you call new Internet users?**
   A. Lusers.
   B. Newbies.
   C. Users.
3. **Java is . . .**
   A. The Devil's spawn.
   B. Cool.
   C. A programming language.
4. **COM and OLE are . . .**
   A. Depressing.
   B. Irritating.
   C. Microsoft APIs.
5. **Windows is . . .**
   A. Atrocious.
   B. Atrocious.
   C. Atrocious.
6. **You see vendors as . . .**
   A. The enemy.
   B. A necessary evil.
   C. Partners.
7. **Your idea of a good read is . . .**
   A. The trade papers.
   B. Technical documentation.
   C. *The Wall Street Journal.*
8. **(Your favorite operating system) is . . .**
   A. Better than sex.
   B. As good as sex.
   C. Are you kidding me?
9. **If your e-mail doesn't work, you feel . . .**
   A. Desperate.
   B. Unperturbed.
   C. Relieved.
10. ***Network World* is . . .**
    A. Fantastic.
    B. Indispensable.
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Now score 3 for each A, 2 for each B and 1 for each C. If your score is 10, you are a normal, rational human being. What are you doing in IT? Eleven to 20, you are a solid, well-informed IT professional. More than 20, you fall somewhere in the range of over-involved to seriously disturbed. You are an ideal IT employee. If you live in L.A., call me at once — I may have a job for you . . .

Résumés to nwcolumn@gibbs.com.

'NET BUZZ

The latest on the Internet/intranet industry

PAUL MCNAMARA

Maybe those doomsayers who argue that the Internet is dehumanizing really do have a point.

According to new research from **Dataquest,** the number of U.S. adults who admit to surfing the Internet and watching television — at the same time — increased to 27 million last year from only 8 million in 1998.

That threefold-plus increase would look remarkable in any light, but keep this in mind: An accurate measure of **"telewebbers"** — that's what we're calling these multitasking surfer/viewers — needs to account for the fact that a lot of people would be embarrassed to tell a pollster they do such a thing. (At least they *should* be embarrassed.) Which means that 27 million count is on the low side.

Dataquest draws this conclusion from its research: PCs are bound to take on ever more TV-like qualities, while television embraces the interactivity that has made the Internet an entertainment phenomenon.

Who would argue otherwise?

What concerns me, however, are these 27 million impatient souls who can't wait for the maturation of PC/TV convergence. One can only hope they do their telewebbing at a safe distance from others.

Fights over the remote control are already the top cause of marital discord in this country. Add a mouse to that mix and the very institution of marriage could be in danger.

A catchy name can mean the world for a start-up. A lousy name can spell trouble.

Here's a good one: BRICKHouse, a division of Systems Advisory Group Enterprises in Amarillo, Texas, which makes security software. The company appropriated its BRICKHouse moniker from "The Three Little Pigs" fairy tale — not that piggish '70s song by the Commodores. As you no doubt recall, the fairy-tale pig who built his abode of brick turned out to be most secure when that Big Bad Wolf tried hacking into the company network.

What's truly cool about BRICKHouse is the URL conjured up by those clever folks down in Amarillo: www.thirdpig.com.

On the not-so-hot side: Last week, *Network World* carried a story about a California start-up called **Intacct Corp.** Intacct is an application service provider specializing in accounting software.

Get it? "Int" for Internet; "acct" for accounting.

The name does make more sense when seen as part of a two-color company logo, but we're talking about one ugly URL: www.intacct.com.

No one will be able to forget thirdpig.com. . . . No one will be able to spell intacct.com.

My favorite e-commerce story of the week comes courtesy of 'Net Buzz reader **Al Chisholm,** chief technical officer at Intellution in Norwood, Mass. Chisholm was shopping for antique books on the **Barnes & Noble** Web site (www.bn.com) when he saw a profitable illustration — profitable for him, not the bookseller — of how old-fashioned retailers are having a hard time adjusting to life online.

"I was reading the descriptions of some books my wife and I were interested in and noticed there were figures at the ends of the descriptions of all the books available from a particular third-party vendor — a large antique bookshop in California," Chisholm recounts. "It was not obvious that they were prices, but they were consistently 30% lower than the bn.com asking price. A bit of additional effort found us the Web site of the third-party vendor, and, sure enough, those smaller numbers were that vendor's asking price."

Customer service is one thing. Directing your customers to a significantly cheaper supply of what you're trying to sell is quite another.

Chisholm attributes his good fortune to "the wonders of getting computers to blindly import data without actually ever having a human look at it."

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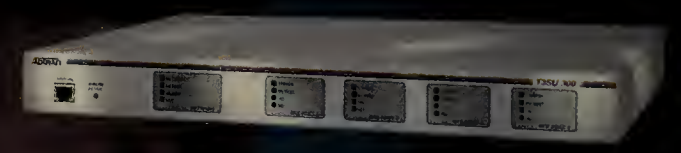

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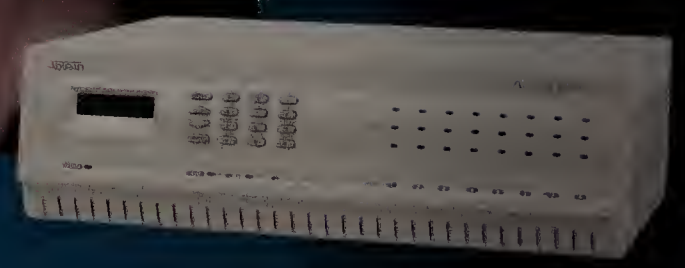

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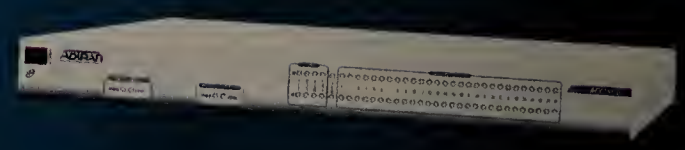

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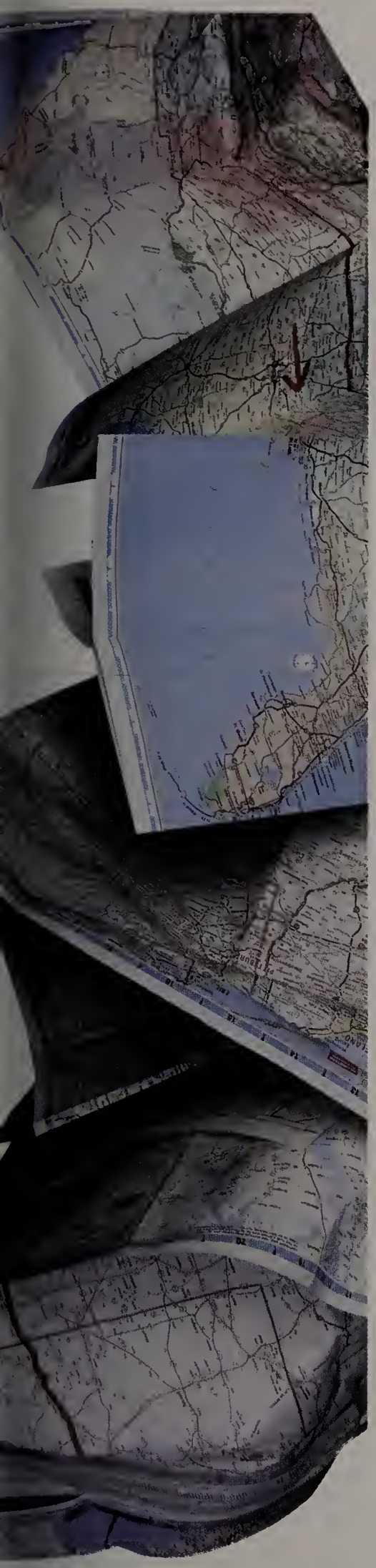

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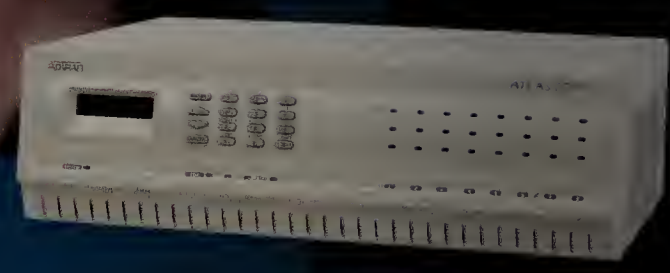

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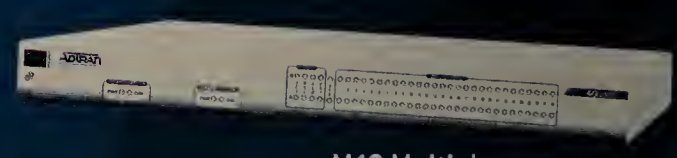

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